COLORADO
Department of Public Health & Environment

Exceptional Event Demonstration for Ozone on September 2 and 4, 2017

Prepared by the
Air Pollution Control Division
Colorado Department of Public Health and Environment

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Executive Summary

The Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division (APCD) identified that wildfires in the northwestern United States caused ozone (O_3) exceedances at four O_3 monitoring sites on September 2, 2017 and six O_3 monitoring sites on September 4, 2017 in Colorado (see Table 2). These two events are sourced to smoke from numerous wildfires in the northwestern United States, which transported smoke to the southeast and increased O_3 concentrations in the northern Front Range region of Colorado. Under the Clean Air Act (CAA), the Exceptional Events Rule (EER) allow the exclusion of air quality monitoring data influenced by exceptional events from use in determinations of exceedances of the National Ambient Air Quality Standards (NAAQS). This document provides a description of the events, an overview of the EER, and the regulatory significance of this demonstration. In addition, the following information presented in this document satisfies all of the EER criteria and includes:

Table 1: Summary of APCD demonstration based on EER Requirements

EER Requirement	Section	Summary
Narrative conceptual model	3	The narrative conceptual model describes the affected area, meteorological conditions of the region and the source causing the exceedances. It includes a discussion of how emissions from the wildfires led to the exceedances in relation to the chemistry of event and non-event O_3 formation in the area.
Clear Causal Relationship	4	The wildfires affected air quality in such a way that there exists a clear causal relationship between the wildfires and the monitored exceedances. This section includes the following: evidence that the wildfires emissions were transported to the monitors; evidence that emissions from the wildfires influenced the monitored concentrations; quantification of the

ED_002666_00009483-00002

		wildfires emissions contributing to the monitored O_3 exceedances, and; a comparison of O_3 data requested for exclusion against historical O_3 concentrations at the affected monitors.
Natural event or caused by human activity that is unlikely to recur	5	The natural event or human activity that is unlikely to recur requirement is met by demonstrating that the events meet the EER definition of wildfire. APCD provides evidence that the wildfires were natural events, none of the wildfires were caused by human activity, and they occurred on wildland.
Not Reasonably Controllable or Preventable	6	The not reasonably controllable or preventable requirement is met by demonstrating that the wildfires were natural events and occurred on wildland.
Procedural requirements	7	APCD met EER procedural requirements for flagging, initial notification, demonstration, and public comment as summarized in this section.

The APCD is requesting concurrence on exclusion of the NAAQS exceedances and monitored O_3 values from Table 2 in that they meet the criteria in the EER as summarized in Table 1.

Table 2: Daily Maximum 8-hour O_3 Concentrations for the Exceptional Event

Site Name AQSID	Aspen Park 08-059-0013	Chatfield 08-035-0004	Highland 08-005-0002	NREL 08-059-0011	RFN 08-059-0006	Welch 08-059-0005
9/2/2017	--- *	**0.071 ppm**	--- *	**0.076 ppm**	**0.071 ppm**	**0.075 ppm**
9/4/2017	**0.072 ppm**	**0.073 ppm**	**0.071 ppm**	**0.076 ppm**	**0.078 ppm**	**0.074 ppm**
Affected hours to be excluded:						
9/2/2017	--- *	9 - 17	--- *	8 - 20	10 - 19	8 - 18
9/4/2017	10 - 19	9 - 19	10 - 17	7 - 19	6 - 19	8 - 19

* Not requested for event concurrence

ED_002666_00009483-00003

Table of Contents

List of Tables iv
List of Figures v
List of Appendices xi
Acronyms xii
1.0 Overview 1
1.1 Event Summary and Related Concentrations 1
1.2 Exceptional Event Rule Summary 1
1.3 Demonstration Outline 3
2.0 Regulatory Significance 5
3.0 Narrative Conceptual Model 6
3.1 Regional Description 6
3.1.1 Monitor Descriptions: O_3 Monitoring Network 6
3.1.2 Area Climate: Seasons and Summertime Weather 8
3.2 Characteristics of Non-Event O_3 Formation 8
3.2.1 Non-Event Weather Patterns 8
3.2.2. NO_x and VOC Emissions 11
3.2.3 Non-Event Historical O_3 Concentrations 12
3.3 Characteristics of Event O_3 Formation 13
3.3.1 Event O_3 and $PM_{2.5}$ Measurements 13
3.3.2 Summary of Meteorological Conditions during Episode 16
3.3.3 Summary of Wildfire Conditions during Episode 33
4.0 Clear Causal Relationship 54
4.1 Introduction 54
4.2 Event Analysis 54
4.2.1 September 2, 2017 Exceedance 55
4.2.2 September 4, 2017 Exceedance 69
4.2.3 Historical Fluctuations of O_3 Concentrations in the DM/NFR area 83
4.2.4 Historical Fluctuations of $PM_{2.5}$ Concentrations in the DM/NFR area 97
5.0 Caused by Human Activity that is Unlikely to Recur 104
6.0 Not Reasonably Controllable or Preventable 105
7.0 Public Comment 106
8.0 Conclusion 107
9.0 References 107

ED_002666_00009483-00004

List of Tables

Table 1: Summary of APCD demonstration based on EER Requirements i
Table 2: Daily Maximum 8-hour O_3 Concentrations for the Exceptional Event ii
Table 3: Summary of Tiered Analysis 4
Table 4: Daily Maximum 8-hour O_3 Concentrations for the Exceptional Event 5
Table 5: 2017 DM/NFR Monitoring Sites (regulatory) 6
Table 6: Average Temperatures and Precipitation for Denver, 1981 - 2010 8
Table 7: Emissions Inventory for the DM/NFR O_3 Non-Attainment Area 11
Table 8: Summary of September Non-Event Max Daily 8-hour Average O_3 Data (2011-2016) .. 12
Table 9: Summary of 2-Week Non-Event Max Daily 8-hr Average O_3 Data (August 26 to September 9, 2011-2016) 13
Table 10: Daily 8-hour Daily Max O_3 Concentrations (ppm) - DM/NFR Sites 14
Table 11: Wildfire information for fires affecting September 2, 2017 O_3 exceedances. 68
Table 12: Wildfire information for fires affecting September 4, 2017 O_3 exceedances. 82
Table 13: Summary of September Non-Event Maximum Daily 8-hour Average O_3 Data (2011-2016) 84
Table 14: September 2 and 4, 2017 Event Percentiles of Max Daily 8-hour Average O_3 for September 2011 to 2016 Data 84
Table 15: Summary of 2-Week Non-Event Max Daily 8-hr Average O_3 Data (August 26 to September 11, 2011-2016) 85
Table 16: September 2 & 4, 2017 Event Percentiles for Max Daily 8hr Average O_3 for August 26 to September 11, 2011 to 2016 Data 86
Table 17: September 2 & 4, 2017 Event Rank Values for Max Daily 8hr Average values for September 4, 2016 to September 4, 2017 87
Table 18: FRM Sample Values September 2017 97
Table 19: 2013 - 2017 FRM Data Summary, Affected Sites 97
Table 20: Site Percentile (All Affected Front Range Sites) 98
Table 21: Daily Maximum 8-hour O_3 Concentrations for the Exceptional Event 107

ED_002666_00009483-00005

List of Figures

Figure 1: 2017 North Front Range Area O_3 Monitoring Sites (regulatory) 7

Figure 2: Daytime Thermally-Driven Upslope Flows (red arrows) Toward Higher Terrain 10

Figure 3: Source Regions for Four Highest 8-hour Concentrations Based on Relative Densities of 24-hour NOAA HYSPLIT Back Trajectories 10

Figure 4: Stacked O_3 and $PM_{2.5}$ Hourly Time Series 15

Figure 5: Total precipitation in inches, Western Regional Climate Center, northwest region, July 2017..... 16

Figure 6: Total precipitation in inches, Western Regional Climate Center, northwest region, August 2017. 17

Figure 7: Departure from normal temperature (degrees Fahrenheit), Western Regional Climate Center, northwest region, July 2017. 17

Figure 8: Departure from normal temperature (degrees Fahrenheit), Western Regional Climate Center, northwest region, August 2017. 18

Figure 9: Drought conditions for the western U.S. at 5:00 AM MST August 29, 2017. 19

Figures 10a-d: NOAA 500 mb height and wind analysis at (a) 5:00 PM MST (0Z August 31, 2017) August 30, 2017; (b) 5:00 AM MST (12Z) August 31, 2017; (c) 5:00 PM MST (0Z September 1, 2017) August 31, 2017; and (d) 5:00 AM MST (12Z) September 1, 2017..... 21

Figures 10e-h: ....NOAA 500 mb height and wind analysis at (e) 5:00 PM MST (0Z September 2, 2017) September 1, 2017; (f) 5:00 AM MST (12Z) September 2, 2017; (g) 5:00 PM MST (0Z September 3, 2017) September 2, 2017; and (d) 5:00 AM MST (12Z) September 3, 2017. 22

Figures 10i-k: NOAA 500 mb height and wind analysis at (i) 5:00 PM MST (0Z September 4, 2017) September 3, 2017; (j) 5:00 AM MST (12Z) September 4, 2017; (k) 5:00 PM MST (0Z September 5, 2017) September 4, 2017..... 23

Figure 11a: MODIS Terra True Color satellite image with HMS Fire detection at 5:00 PM MST on August 31, 2017. 24

Figure 11b: MODIS Terra True Color satellite image with HMS Fire detection at 5:00 PM MST on September 1, 2017..... 25

Figure 11c: MODIS Terra True Color satellite image with HMS Fire detection at 5:00 PM MST on September 2, 2017..... 26

ED_002666_00009483-00006

Figure 11d: MODIS Terra True Color satellite image with HMS Fire detection at 5:00 PM MST on September 3, 2017. 27
Figure 11e: MODIS Terra True Color satellite image with HMS Fire detection at 5:00 PM MST on September 4, 2017. 28
Figures 12a-d: NOAA surface analysis at (a) 5:00 PM MST (0Z August 31, 2017) August 30, 2017; (b) 5:00 AM MST (12Z) August 31, 2017; (c) 5:00 PM MST (0Z September 1, 2017) August 31, 2017; and (d) 5:00 AM MST (12Z) September 1, 2017. 29
Figures 12e-h: NOAA surface analysis at (e) 5:00 PM MST (0Z September 2, 2017) September 1, 2017; (f) 5:00 AM MST (12Z) September 2, 2017; (g) 5:00 PM MST (0Z September 3, 2017) September 2, 2017; and (h) 5:00 AM MST (12Z) September 3, 2017... 30
Figures 12i-k: NOAA surface analysis at (i) 5:00 PM MST (0Z September 4, 2017) September 3, 2017; (j) 5:00 AM MST (12Z) September 4, 2017; (k) 5:00 PM MST (0Z September 5, 2017) September 4, 2017 31
Figures 13a-c: NAM analysis surface wind vectors and speed for (a) 2:00 PM MST (21Z) August 31, 2017, (b) 2:00 PM MST (21Z) September 1, 2017, (c) 2:00 PM MST (21Z) September 2, 2017.. 32
Figures 13d-e: NAM analysis surface wind vectors and speed (d) 2:00 PM MST (21Z) September 3, 2017, and (e) 2:00 PM MST (21Z) September 4, 2017. 33
Figure 14: Significant Wildland Fire Potential Outlook for August 2017. 34
Figure 15: Significant Wildland Fire Potential Outlook for September 2017. 35
Figure 16a: HMS Fire and Smoke detection at 5:00 PM MST on August 31, 2017..... 36
Figure 16b: HMS Fire and Smoke detection at 5:00 PM MST on September 1, 2017. 37
Figure 16c: HMS Fire and Smoke detection at 5:00 PM MST on September 2, 2017. 38
Figure 16d: HMS Fire and Smoke detection at 5:00 PM MST on September 3, 2017. 39
Figure 16e: HMS Fire and Smoke detection at 5:00 PM MST on September 4, 2017. 40
Figure 17a: ..... HMS Smoke detection and 8-hr O_3 maximum concentration on August 31, 2017. (source: https://airnowtech.org/navigator)..... 41
Figure 17b: HMS Smoke detection and 8-hr O_3 maximum concentration on September 1, 2017..... 42
Figure 17c: HMS Smoke detection and 8-hr O_3 maximum concentration on September 2, 2017..... 43
Figure 17d: HMS Smoke detection and 8-hr O_3 maximum concentration on September 3, 2017..... 44

ED_002666_00009483-00007

Figure 17e: HMS Smoke detection and 8-hr O_3 maximum concentration on September 4, 2017 45
Figure 18a: HMS Smoke detection and 24-hr average $PM_{2.5}$ concentration on August 31, 2017 46
Figure 18b: HMS Smoke detection and 24-hr average $PM_{2.5}$ concentration on September 1, 2017 47
Figure 18c: HMS Smoke detection and 24-hr average $PM_{2.5}$ concentration on September 2, 2017 48
Figure 18d: HMS Smoke detection and 24-hr average $PM_{2.5}$ concentration on September 3, 2017 49
Figure 18e: HMS Smoke detection and 24-hr average $PM_{2.5}$ concentration on September 4, 2017 50
Figure 19: Grand Junction NWS office social media post on wildfire smoke in the region on September 2, 2017 53
Figure 20: Maximum 8-hr average O_3 in ppb within the DM/NFR area on 9/2/2017, inset of the State of Colorado for geographical reference 57
Figure 21: HRRR and GDAS 18-hour HYSPLIT back trajectories starting at 7 AM MST (12Z) September 2, 2017 58
Figure 22: GDAS 33-hour HYSPLIT forward trajectory matrix from NE Wyoming/SE Montana wildfires at 2500 meters AGL, starting at 5 PM MST (0Z September 1, 2017) August 31, 2017 and ending at 2 AM MST (9Z) September 2, 2017 58
Figure 23: GDAS 9-hour HYSPLIT forward trajectory matrix from NE Wyoming/SE Montana wildfires at 2500 meters AGL, starting at 5 PM MST (0Z September 2, 2017) September 1, 2017 and ending at 2 AM MST (9Z) September 2, 2017 59
Figures 24a-b: NAM Analysis Planetary Boundary Layer height in meters AGL, (a) 2 PM MST (21Z) August 31, 2017, and (b) 2 PM MST (21Z) September 1, 2017 59
Figures 25a-b: ..MODIS Aqua image with Hazard Mapping System (HMS) detected hot spots, (a) August 31, 2017 at approximately 1:07 PM MST (1807Z),and (b) September 1, 2017 (combined image of two satellite passes with western half of the image at approximately 1:50 PM MST (2050Z) and the eastern half of the image at approximately 12:10 PM MST (1910Z) 60
Figure 26: AIRS Aqua Total Column CO at approximately 12:52 PM MST (1952Z) September 2, 2017 61

ED_002666_00009483-00008

Figure 27: GOES Aerosol Smoke Products West AOD, EPA Region 7, 8:00 AM MST (15Z) September 2, 2017 61
Figure 28: MODIS Terra AOD at approximately 11:12 AM MST (1812Z) and NAM Analysis wind vectors at 11:00 AM MST (1800Z) on September 2, 2017 62
Figure 29: NAM Analysis Planetary Boundary Level height in meters AGL, 2:00 PM MST (21Z) September 2, 2017 62
Figure 30: Denver webcam image at 10:57 AM MST September 2, 2017 63
Figure 31: Denver webcam image at 10:57 AM MST September 2, 2015 63
Figure 32: Black carbon absorption from APCD's near-road aethalometer measurement in central Denver on August 30, 2017 64
Figure 33: Black carbon absorption from APCD's near-road aethalometer measurement in central Denver on September 2, 2017. 64
Figures 34a-d: ..... Surface relative humidity isopleths, wind vectors, and wind speed color contours from NAM analysis with fire locations (black dots) at (a) 2:00 PM MST (21Z) August 31, 2017, (b) 5:00 AM MST (12Z) September 1, 2017, (c) 8:00 AM MST (15Z) September 1, 2017, (d) 2:00 PM MST (21Z) September 1, 2017. 67
Figure 35: Maximum 8-hr average O_3 in ppb within the DM/NFR area on 9/4/2017, inset of the State of Colorado for geographical reference 71
Figure 36: GDAS 48-hour HYSPLIT back trajectory starting at 2 PM MST (21Z) September 2, 2017 and ending at 2 PM MST (21Z) September 4, 2017 72
Figure 37: NAM Analysis Planetary Boundary Level height in meters AGL at 2:00 PM MST (21Z) September 2, 2017 73
Figure 38: HRRR and GDAS 48-hour HYSPLIT back trajectories starting at 2 PM MST (21Z) September 2, 2017 and ending at 2 PM MST (21Z) September 4, 2017 73
Figures 39a-b: Active wildfires on September 2, 2017 in (a) central Washington, and (b) northern Idaho and western Montana 74
Figure 40: GDAS 18-hour HYSPLIT forward trajectories from the Big Red wildfire at 2000, 2500, and 3000 meters AGL, starting at 5:00 PM MST (0Z September 4, 2017) September 3, 2017 and ending at 11:00 AM MST (18Z) September 4, 2017 75
Figure 41: NAM Analysis Planetary Boundary Level height in meters AGL, 2 PM MST (21Z) September 3, 2017 75

ED_002666_00009483-00009

Figures 42a-c: MODIS Aqua image with HMS detected hot spots for (a) September 2, 2017 (combined image of two satellite passes with the western half of the image at approximately 2:32 PM MST (2132Z) and the eastern half of image at approximately 12:55 PM MST (1955Z)), (b) September 3, 2017 at approximately 1:37 PM MST (2037Z), and (c) September 4, 2017 (combined image of two satellite passes with the western half of the image at approximately 2:21 PM MST (2121Z) and the eastern half of image at approximately 12:42 PM MST (1942Z) 76
Figures 43a-d: NOAA surface analysis for northwestern US at (a) 5:00 AM MST (12z) on September 3, 2017, (b) 5:00 PM MST (0Z 9/4/2017) on September 3, 2017, (c) 5:00 AM MST (12Z) on September 4, 2017, and (d) 5:00 PM MST (0Z 9/5/2017) on September 4, 2017 77
Figures 44a-b: Denver webcam image at (a) 8:29 AM MST and (b) 2:58 PM MST, on September 4, 2017 78
Figure 45: Black carbon absorption from APCD's near-road aethalometer measurement in central Denver on September 4, 2017. 79
Figures 46a-c: NAM Analysis surface relative humidity isopleths, wind vectors, and wind speed color contours with fire locations (black dots) at (a) 2:00 PM MST (21Z) September 2, 2017, (b) 5:00 PM MST (00Z September 3, 2017) September 2, 2017, and (c) 8:00 PM MST (03Z September 3, 2017) September 2, 2017. 81
Figure 47: Monthly Non-Event Historical Comparison Plots for Aspen Park (AQS ID 080590013) and Chatfield (AQS ID 080350004) 88
Figure 48: Monthly Non-Event Historical Comparison Plots for Highland (AQS ID 080050002) and NREL (AQS ID 080590011) 89
Figure 49: Monthly Non-Event Historical Comparison Plots for RFN (AQS ID 080590006) and Welch (AQS ID 080590005) 90
Figure 50: 2-Week Non-Event Historical Comparison Plots for Aspen Park (AQS ID 080590013) and Chatfield (AQS ID 080350004) 91
Figure 51: 2-Week Non-Event Historical Comparison Plots for Highland (AQS ID 080050002) and NREL (AQS ID 080590011) 92
Figure 52: 2-Week Non-Event Historical Comparison Plots for RFN (AQS ID 080590006) and Welch (AQS ID 080590005) 93

ED_002666_00009483-00010

Figure 54: Diurnal Deviation from Normal Plots for hourly data at Highland (AQS ID 080050002) and NREL (AQS ID 080590011) 95
Figure 55: Diurnal Deviation from Normal Plots for hourly data at RFN (AQS ID 080590006) and Welch (AQS ID 080590005) 96
Figure 56: Front Range Hourly $PM_{2.5}$ Concentrations 98
Figure 57: Platteville $PM_{2.5}$ Box and Whisker Plot 99
Figure 58: CAMP $PM_{2.5}$ Box and Whisker Plot 100
Figure 59: Chatfield $PM_{2.5}$ Box and Whisker Plot 101

ED_002666_00009483-00011

List of Appendices

Appendix A: Media and Social Media Posts

Appendix B: NWS Forecast Discussion and NOAA Narrative for Smoke/Dust Observed in Satellite Imagery

Appendix C: Wildfire Incident Information

Appendix D: APCD Air Quality Advisories, September 1-4, 2017

Appendix E: Public Comment

ED_002666_00009483-00012

Acronyms

AGL	Above ground level
AOD	Aerosol Optical Depth
APCD	Air Pollution Control Division
AQS	Air Quality System
AQSI	Air Quality System Identifier
BLM	Bureau of Land Management
CAA	Clean Air Act
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DJ	Denver-Julesburg
DM/NFR	Denver Metro/Northern Front Range
EER	Exceptional Event Rule
EPA	Environmental Protection Agency
°F	Degrees Fahrenheit
FS	U.S. Forest Service
FRM	Federal Reference Method
GDAS	Global Data Assimilation System
HMS	Hazard Mapping System
HRRR	High-Resolution Rapid Refresh
HYSPLIT	Hybrid Single-Particle Lagrangian Integrated Trajectory
IR	Infrared
mb	Millibar
MODIS	Moderate Resolution Imaging Spectroradiometer
MST	Mountain Standard Time
NAAQS	National Ambient Air Quality Standards
NAM	North American Model
NOAA	National Oceanic and Atmospheric Administration
NO_x	Oxides of Nitrogen
NPS	National Park Service
NREL	National Renewable Energy Laboratory
NWS	National Weather Service
O_3	Ozone
PBL	Planetary Boundary Layer
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter less than or equal to 2.5 microns in aerodynamic diameter
PM_{10}	Particulate Matter less than or equal to 10 microns in aerodynamic diameter
ppb	Parts Per Billion
ppm	Parts Per Million
RFN	Rocky Flats North
SIP	State Implementation Plan

ED_002666_00009483-00013

1.0 Overview

The APCD has determined that O_3 concentrations exceeding the NAAQS on September 2 and 4, 2017 qualify as an exceptional event under Title 40, Part 50 of the Code of Federal Regulations (CFR), the revised EER. The purpose of this document is to provide technical documentation to support a concurrence and petition the Regional Administrator for Region 8 of the U.S. Environmental Protection Agency (EPA) to exclude air quality monitoring data for O_3 from the normal planning and regulatory requirements under the CAA in accordance with the EER. This exceptional event demonstration was published for public review and comment on April 6, 2018 (see Section 7). Comments were submitted to cdphe.commentsapcd@state.co.us and were accepted until 5:00 p.m. on May 16, 2018, which was a requested extension from the original May 9, 2018 date.

1.1 Events Summary and Related Concentrations

On September 2 and September 4, 2017, the APCD monitored three exceedances of the 2008 0.075 parts per million (ppm) 8-hour O_3 NAAQS and ten exceedances of the 2015 0.070 ppm 8-hour O_3 NAAQS, with maximum daily 8-hour average O_3 concentrations reaching 0.076 ppm and 0.078 ppm on September 2 and September 4, respectively. These elevated concentrations were a result of wildfire smoke which contained O_3 and O_3 precursors from numerous wildfires in the Pacific Northwest, Wyoming, Idaho and Montana that were transported to Colorado's Denver Metro/Northern Front Range (DM/NFR) on prevailing winds. With respect to the 2008 0.075 ppm 8-hour O_3 NAAQS, these elevated O_3 concentrations resulted in exceedances at the Rocky Flats North (RFN) site on September 4, 2017, and the National Renewable Energy Laboratory (NREL) site on both September 2 and 4, 2017. Elevated $PM_{2.5}$ concentrations support the presence of wildfire smoke; this is further described in the historical significance section below.

1.2 Exceptional Event Rule Summary

EPA promulgated the EER in 40 CFR Parts 50 and 51 on March 22, 2007 (72 FR 13560), pursuant to the 2005 amendment of CAA section 319(b), which allows for the exclusion of air quality monitoring data influenced by exceptional events from use in determinations of exceedances or violations of NAAQS, provided that:

ED_002666_00009483-00014

1. The occurrence of an exceptional event must be demonstrated by reliable, accurate data that is promptly produced and provided by Federal, State, or local government agencies;
2. A clear causal relationship must exist between the measured exceedances of a national ambient air quality standard and the exceptional event to demonstrate that the exceptional event caused a specific air pollution concentration at a particular air quality monitoring location;
3. There is a public process for determining whether an event is exceptional; and
4. There are criteria and procedures for the Governor of a State to petition the Administrator to exclude air quality monitoring data that is directly due to exceptional events from use in determinations by the Administrator with respect to exceedances or violations of the national ambient air quality standards.

The 2016 EER revisions added sections 40 CFR 50.1(j)-(r), 50.14, and 51.930. The EER as defined in 40 CFR 50.14 states that "…a State that has flagged data as being flagged due to an exceptional event and is requesting exclusion of the affected measurement data shall, after notice and opportunity for public, submit a demonstration to justify data exclusion to the Administrator according to the schedule established under paragraph (c)(2)(i)(B)." Per 40 CFR 50.14(c)(3)(iv)(A)-(E), the demonstration to justify data exclusion must include:

1. A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s);
2. A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation;
3. Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the requirement at paragraph (c)(3)(iv)(B) of this section. The Administrator shall not require a State to prove a specific percentile point in the distribution of data;
4. A demonstration that the event was both not reasonably controllable and not reasonably preventable; and
5. A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event.

With respect to wildfires, 40 CFR 50.14(b)(4) states that "The Administrator shall exclude data from use in determinations of exceedances and violations where a State demonstrates to the Administrator's satisfaction that emissions from wildfires caused a specific air pollution concentration in excess of one or more national ambient air quality standard at a particular air quality monitoring location and otherwise satisfies the requirements of this section. Provided the Administrator determines that there is no compelling evidence to the contrary in the record, the Administrator will determine every wildfire occurring predominantly on wildland to have met the requirements identified in paragraph (c)(3)(iv)(D) of this section regarding the not reasonably controllable or preventable criterion." In addition, the air agency must meet several procedural requirements, including:

1. Submission of an Initial Notification of Potential Exceptional Event and flagging of the affected data in EPA's Air Quality System (AQS) as described in 40 CFR 50.14(c)(2)(i); and
2. Completion and documentation of the public comment process described in 40 CFR 50.14(c)(3)(v).

1.3 Demonstration Outline

The EPA Guidance on the Preparation of Exceptional Event Demonstrations for Wildfire Events that May Influence Ozone Concentrations, hereafter referred to as "Guidance", provides recommendations for the preparation and submission of exceptional event demonstrations for wildfire influences on O_3 (EPA, 2016). The Guidance was used to create the following outline for this demonstration:

- Regulatory Significance: the exceptional events rule applies to regulatory actions in CAA section 319, including area designations and redesignations; area classifications; attainment determinations; attainment date extensions; findings of State Implementation Plan (SIP) inadequacy leading to a SIP call; and other provisions as stated in 40 CFR 50.14(a)(1)(i).
- Narrative Conceptual Model: 40 CFR 50.14(c)(3)(iv)(A) requires the inclusion of a narrative conceptual model that describes the event; the interaction of emissions, meteorology, and chemistry of event and non-event O_3 formation in the area, and; the regulatory significance of the proposed data exclusion.

ED_002666_00009483-00016

- Clear Casual Relationship and Supporting Analysis: 40 CFR 50.14(c)(3)(iv)(B)-(C) requires a technical description of the relationship between the specific event and the monitored exceedance. This includes a comparison of historical O_3 concentrations at the air quality monitor and data requested for exclusion. The Guidance recommends use of a tiered analysis to address the clear causal relationship element within a demonstration (see Table 3). In preparation of this demonstration, the APCD and the EPA agreed that the event qualifies for Tier 2 causal analyses.

Table 3: Summary of Tiered Analysis

Tier 1	Tier 2	Tier 3
Wildfires that clearly influence monitored O_3 exceedances or violations when they occur in an area that typically experiences lower O_3 concentrations. This tier is associated with an O_3 concentration that is clearly higher than non-event related concentrations, or occur outside of the area's normal O_3 season.	The wildfire event's O_3 influences are higher than non-event related concentrations, and fire emissions compared to the fire's distance from the affected monitor indicate a clear causal relationship.	The wildfire does not fall into the specific scenarios that qualify for Tier 1 or Tier 2, but the clear causal relationship criterion can still be satisfied by a weight of evidence showing.

- Caused by Human Activity that is Unlikely to Recur at a Particular Location or a Natural Event: 40 CFR 50.14(c)(3)(iv)(E) states that a demonstration must establish that the event was caused by "a human activity that is unlikely to recur at a particular location or was a natural event."
- Not Reasonably Controllable or Preventable: 40 CFR 50.14(c)(3)(iv)(D) states that a demonstration must establish "that the event was both not reasonably controllable and not reasonably preventable."
- Public Comment: 40 CFR 50.14(c)(1)(i), air agencies must "notify the public promptly whenever an event occurs or is reasonably anticipated to occur which may result in the exceedance of an applicable air quality standard." In addition, according to 40 CFR 50.14(c)(3)(v), air agencies must "document [in their exceptional events demonstration] that the [air agency] followed the public comment process and that the comment period was open for a minimum of 30 days…." Further, air agencies must submit any received public comments to the EPA and address in their submission those comments disputing or contradicting the factual evidence in the demonstration.

ED_002666_00009483-00017

2.0 Regulatory Significance

Per 40 CFR 50.14(a)(1)(i), the EER applies to data showing an exceedance of a standard which may affect regulatory determinations regarding attainment designation status or other action by the Administrator. A site is in violation of the 2008 and 2015 NAAQS 8-hour standards if the monitored design value for that site is in exceedance of 0.075 ppm or 0.070 ppm, respectively. The O_3 design value is derived from the 3-year average of the fourth highest 8-hour maximum daily average monitored O_3 level.

The O_3 ambient air monitoring network in the DM/NFR consists of 14 stations operated by the APCD and one location (two stations) operated by the National Park Service (NPS) and the EPA in Rocky Mountain National Park. On September 2 and September 4, 2017, the APCD monitored three exceedances of the 2008 0.075 ppm 8-hour O_3 NAAQS and 10 exceedances of the 2015 0.070 ppm 8-hour O_3 NAAQS in this area.

On May 4, 2016, the EPA published a final rule that determined Colorado's marginal O_3 nonattainment area failed to attain the 2008 eight-hour O_3 NAAQS by the applicable marginal attainment deadline and therefore was reclassified the DM/NFR area to moderate. This action requires attainment of the NAAQS no later than July 20, 2018 based on 2015-2017 O_3 season data. This exceptional event exclusion will prevent an immediate reclassification in Colorado's DM/NFR O_3 non-attainment area from "moderate" to "serious" under the 2008 O_3 Standard with regard to this three-year dataset (2015-2017). Exclusion of this data may also affect future non-attainment designations under the 2015 O_3 Standard. The APCD requests that the observed data on September 2 and 4, 2017 at the monitors listed in Table 4 be excluded from regulatory use.

Table 4: Daily Maximum 8-hour O_3 Concentrations for the Exceptional Event

Site Name AQSID	Aspen Park 08-059-0013	Chatfield 08-035-0004	Highland 08-005-0002	NREL 08-059-0011	RFN 08-059-0006	Welch 08-059-0005
9/2/2017	--- *	**0.071 ppm**	--- *	**0.076 ppm**	**0.071 ppm**	**0.075 ppm**
9/4/2017	**0.072 ppm**	**0.073 ppm**	**0.071 ppm**	**0.076 ppm**	**0.078 ppm**	**0.074 ppm**
Affected hours to be excluded:						
9/2/2017	--- *	9 - 17	--- *	8 - 20	10 - 19	8 - 18
9/4/2017	10 - 19	9 - 19	10 - 17	7 - 19	6 - 19	8 - 19

* Not requested for event concurrence

3.0 Narrative Conceptual Model

3.1 Regional Description

3.1.1 Monitor Descriptions: O_3 Monitoring Network

The CDPHE-APCD operates a network of regulatory O_3 sites throughout Colorado, with most focused in the North Front Range O_3 non-attainment area. In addition, the NPS and EPA operate a regulatory site in Rocky Mountain National Park. These regulatory sites meet the U.S. EPA quality assurance criteria as outlined in the U.S. CFR, Title 40, Part 58, Appendix A. A list of these DM/NFR area sites is presented in Table 5 and in a map in Figure 1. Other regulatory and non-regulatory O_3 monitors are operated in Colorado by the APCD, Bureau of Land Management, U.S Forest Service, National Oceanic and Atmospheric Administration, NPS, and the Southern Ute Indian Tribe, but are not listed in this document.

Table 5: 2017 DM/NFR Monitoring Sites (regulatory)

AQS #	Site Name	Address	County	Elev. (m)	Latitude	Longitude
080013001	Welby	3174 E. 78th Ave.	Adams	1,554	39.838119	-104.949840
080050002	Highland Reservoir	8100 S. University Blvd.	Arapahoe	1,747	39.567887	-104.957193
080050006	Aurora - East	36001 E. Quincy Ave.	Arapahoe	1,552	39.63854	-104.56913
080130014	Boulder Reservoir	5565 N. 51st St.	Boulder	1,586	40.070016	-105.220238
080310002	CAMP	2105 Broadway	Denver	1,593	39.751184	-104.987625
080310026	La Casa	4587 Navajo St.	Denver	1,594	39.779429	-105.005174
080350004	Chatfield State Park	11500 Roxborough Pk. Rd.	Douglas	1,676	39.534488	-105.070358
080590005	Welch	12400 W. Hwy. 285	Jefferson	1,742	39.638781	-105.139480
080590006	Rocky Flats - N	16600 W. Hwy. 128	Jefferson	1,802	39.912799	-105.188587
080590011	NREL	2054 Quaker St.	Jefferson	1,832	39.743724	-105.177989
080590013	Aspen Park	26137 Conifer Rd.	Jefferson	2,467	39.540321	-105.296512
080690007	Rocky Mountain NP	Preservation Dr.	Larimer	2,748	40.278145	-105.545660
080690011	Fort Collins - West	3416 La Porte Ave.	Larimer	1,571	40.592543	-105.141122
080691004	Fort Collins - Mason	708 S. Mason St.	Larimer	1,524	40.577470	-105.078920
081230009	Greeley - Tower	3101 35th Ave.	Weld	1,484	40.386368	-104.737440
Non-ozone:						
080310027	I-25 Denver	971 Yuma Street	Denver	1,586	39.732146	-105.015317
081230008	Platteville	1004 Main St.	Weld	1,469	40.209387	-104.824050

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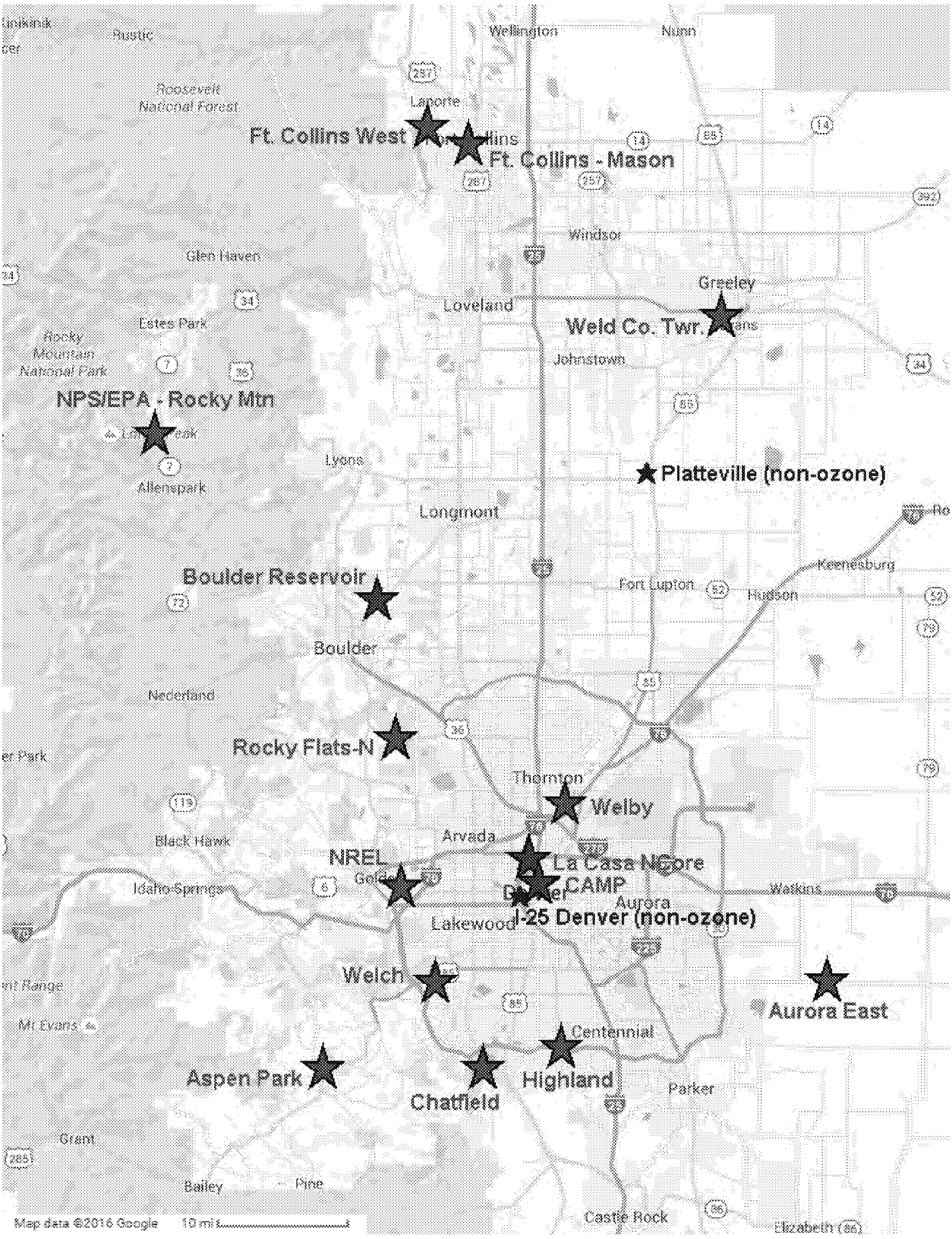

Figure 1: 2017 North Front Range Area O_3 Monitoring Sites (regulatory)

3.1.2 Area Climate: Seasons and Summertime Weather

Colorado's O_3 season is currently defined as year-round in 40 CFR, Part 58, Appendix D. Prior to the 2015 NAAQS O_3 standard, it was set as March 1 to September 30. The typical summer high O_3 season for the DM/NFR area is from May through September when hot days and abundant sunlight are common. Table 6 provides a summary of average high and low temperatures for Denver, as well as average precipitation.

During the summer period, precipitation is primarily related to afternoon thunderstorms. These can be intense and the associated cloud cover prevents O_3 from forming. It is typical for O_3 levels to increase until afternoon clouds build, then quickly decline due to thunderstorms. As these thunderstorms are often isolated, one part of the DM/NFR area may be impacted while O_3 formation continues in another area.

Table 6: Average Temperatures and Precipitation for Denver, 1981 - 2010

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. high temp in °F:	45	46	54	61	72	82	90	88	79	66	52	45
Avg. low temp in °F:	18	19	27	34	43	52	59	57	48	37	25	18
Avg. precip. in inches:	0.39	0.35	0.91	1.69	2.13	1.97	2.17	1.69	0.94	1.02	0.59	0.31

Source: www.usclimatedata.com

3.2 Characteristics of Non-Event O_3 Formation

3.2.1 Non-Event Weather Patterns

High O_3 concentration events are typically associated with specific meteorological conditions that favor optimal O_3 photochemistry and limited dispersion. A recent paper that explores the relationships between meteorology and O_3 concludes that increases in upper level high pressure strength "lead to high July O_3 in much of the western U.S., particularly in areas of elevated terrain near urban sources with high emissions of NO_2 and other O_3 precursors. In addition to bringing warmer temperatures, upper level ridges in this region reduce westerlies at the surface and aloft and allow cyclic terrain-driven circulations to reduce transport away from sources. Upper level ridges can also increase background concentrations within the ridge. O_3 and NO_2 concentrations build locally, and deeper vertical mixing in this region provides a potential mechanism for recapture of O_3 in layers aloft... O_3 precursors and

reservoir species in large-scale basin drainage flows can be brought back to source areas and nearby mountains by daytime, thermally driven upslope flows." (Reddy and Pfister, 2016).

The key elements of a conceptual model for high-concentration episodes along the Front Range include:

- The presence of an upper-level high pressure system or ridge;
- Reduced westerly winds, especially during the day; and
- Thermally-driven upslope flow towards the Continental Divide during the day and downslope drainage flows into the Platte Valley at night. This diurnal cycle of winds enhances the potential for the accumulation of O_3 precursors and O_3 within the region, especially when this cyclic pattern recurs over a period of days.

Figure 2 provides a conceptual map of upslope daytime thermally-driven winds for the DM/NFR area. In contrast, downslope nighttime drainage flows are the opposite. Figure 3 examines four typical summer high O_3 days and compiled Hybrid Single-Particle Lagrangian Integrated (HYSPLIT) back-trajectories to look at potential O_3 precursor source areas. As can be seen, for summer non-event high O_3 days, air flows follow the pattern presented in the conceptual model in Figure 2. For non-event days, the Fort Collins West (FTCW) site is primarily influenced by flows that are from the southeast which includes the Denver-Julesburg (DJ) Basin oil and gas region. For the RFN, NREL, and Chatfield (CHAT) Reservoir sites, airflows from the east-northeast to northeast prevail, which includes the DJ Basin oil and gas region as well as the Denver metropolitan area.

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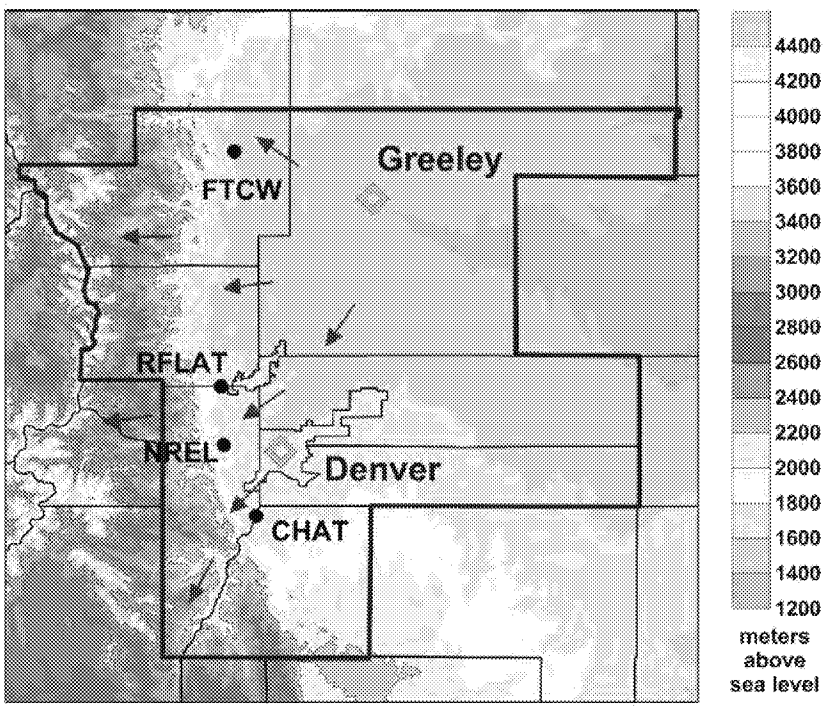
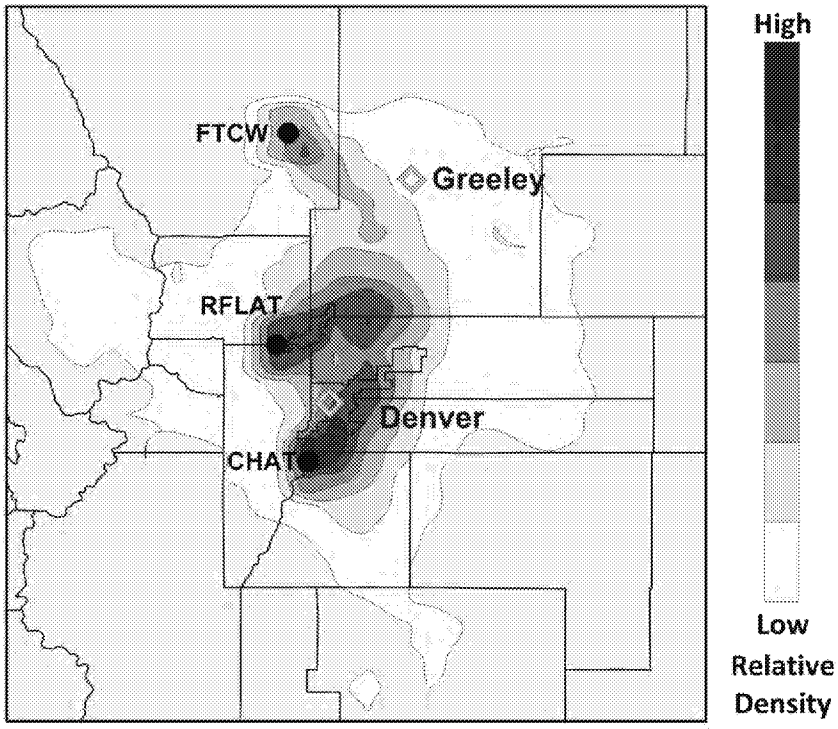


(FTCW = Fort Collins - West, RFLAT = Rocky Flats - North, NREL = National Renewable Energy Lab, CHAT = Chatfield State Park)

Figure 2: Daytime Thermally-Driven Upslope Flows (red arrows) Toward Higher Terrain



(FTCW = Fort Collins - West, RFLAT = Rocky Flats - North, NREL = National Renewable Energy Lab, CHAT = Chatfield State Park)

Figure 3: Source Regions for Four Highest 8-hour Concentrations Based on Relative Densities of 24-hour NOAA HYSPLIT Back Trajectories

3.2.2. NO_x and VOC Emissions

Detailed emission inventories were developed for the 2016 DM/NFR Moderate Bump-Up SIP, including volatile organic compounds (VOC's) and oxides of nitrogen (NO_x). Summertime O_3 is formed from a chemical reaction between VOC's and NO_x in the presence of sunlight. Thus, VOC's and NO_x are key O_3 precursors and critical elements towards any O_3 formation chemistry and modeling efforts. Table 7 provides a summary of the 2011 inventory and projected 2017 inventory, listing key source categories.

Table 7: Emissions Inventory for the DM/NFR O_3 Non-Attainment Area

Source Sector	VOC (tons/day)		NO_x (tons/day)	
	2011	2017	2011	2017
Oil and Gas - *TOTAL*	*279.7*	*154.0*	*41.4*	*65.8*
Point	14.8	16.3	18.1	20.6
Condensate tanks	216.0	78.7	1.1	0.6
Area	48.9	59.0	22.2	44.6
Point (non O&G) - *TOTAL*	*26.5*	*28.4*	*60.7*	*40.1*
Electric generating units	0.7	0.4	39.7	19.2
Point (non-oil & gas)	25.9	28.0	21.0	20.9
Area (non O&G) - *TOTAL*	*60.6*	*67.5*	*0.0*	*0.0*
Non-Road Mobile - *TOTAL*	*58.2*	*44.3*	*75.9*	*54.9*
On-Road Mobile - *TOTAL*	*93.7*	*55.0*	*142.0*	*73.3*
Light duty vehicles	90.0	52.4	102.5	50.3
Medium/heavy duty vehicles	3.7	2.6	39.6	23.0
Biogenic Sources - *TOTAL*	*170.5*	*6.1*	*170.5*	*6.1*
TOTAL Anthropogenic Emissions	*518.8*	*349.2*	*320.0*	*234.0*

Source: Moderate Area O_3 SIP for the Denver Metro and North Front Range Nonattainment Area, 2016

In Table 7, oil and gas is by far the dominant source sector for VOC's, followed by on-road mobile sources (highway vehicles). Most oil and gas development in the North Front Range area is in the DJ Basin, to the northeast of Denver in Weld County. In contrast, on-road and non-road mobile sources dominate the NO_x inventory. Most of these emissions occur in the Denver metropolitan area.

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3.2.3 Non-Event Historical O_3 Concentrations

To illustrate historical non-event max daily 8-hour average O_3 observations in the region, both monthly historical data and data from a two week window surrounding September 2 and 4, 2017 are present here.

Non-event historical data is data prior to 2017 that does not contain an "I" or "R" exceptional event flag. Non-event historical data for the month of September includes all September data for the years 2011 to 2016. Descriptive statistics for the historical data for September is presented in Table 8, with all data values presented in ppm.

Table 8: Summary of September Non-Event Max Daily 8-hour Average O_3 Data (2011-2016)

Evaluation	Aspen Park 080590013	Chatfield 080350004	Highland 080050002	NREL 080590011	RFN 080590006	Welch 080590005
Mean	0.047	0.051	0.049	0.051	0.052	0.046
Median	0.047	0.051	0.050	0.051	0.052	0.047
Mode	0.048	0.056	0.052	0.056	0.046	0.046
St. Dev.	0.008	0.010	0.009	0.010	0.011	0.010
Minimum	0.023	0.017	0.020	0.016	0.018	0.014
99 %ile	0.066	0.071	0.070	0.071	0.078	0.069
Maximum	0.068	0.081	0.073	0.072	0.079	0.071
Range	0.045	0.064	0.053	0.0561	0.061	0.057
Count	172	179	146	177	176	176

Note: Construction at the Highland prohibited the collection of O_3 data from October 2013 through August 2015. Historical evaluations of the Highland data are made with a smaller sample size than other sites.

Since September is a transitional month from peak O_3 season, a more complete picture framing the historical context of the first few days in September may be elucidated examining the two weeks surrounding September 2 and 4. Here, historical non-event max daily 8-hour average O_3 data begins on August 26 and end on September 9 for the years 2011 to 2016 (a week before and after the September 2 and 4 events), with the exception of the Highlands data, as described. The descriptive statistics for this historical data is presented in Table 9, with all data values presented in ppm.

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Table 9: Summary of 2-Week Non-Event Max Daily 8-hr Average O_3 Data (August 26 to September 9, 2011-2016)

Evaluation	Aspen Park 080590013	Chatfield 080350004	Highland 080050002	NREL 080590011	RFN 080590006	Welch 080590005
Mean	0.051	0.056	0.057	0.056	0.057	0.052
Median	0.050	0.055	0.059	0.058	0.058	0.053
Mode	0.050	0.063	0.059	0.059	0.064	0.049
St. Dev.	0.009	0.011	0.009	0.010	0.010	0.010
Minimum	0.032	0.030	0.041	0.029	0.030	0.026
95 %tile	0.067	0.074	0.074	0.072	0.071	0.070
99 %tile	0.073	0.082	0.080	0.076	0.078	0.074
Maximum	0.080	0.086	0.085	0.084	0.079	0.080
Range	0.048	0.056	0.044	0.055	0.049	0.054
Count	81	87	68	90	86	89

3.3 Characteristics of Event O_3 Formation

3.3.1 Event O_3 and $PM_{2.5}$ Measurements

Elevated O_3 was observed at a number of APCD monitors on September 2 and 4, 2017. Table 10 lists daily maximum 8-hour average O_3 concentrations across the DM/NFR air monitoring network for August 30, 2017 through September 7, 2017.

This event-driven episodic increase in O_3 concentrations is seen in Figure 4, as a time series of measurements from monitoring sites which exceeded the level of the 0.070 ppm 2015-NAAQS standard during this period and correlate in time with nearby $PM_{2.5}$ measurements. Figure 4 shows two stacked time series graphs for data from select DM/NFR O_3 sites (top) and continuous $PM_{2.5}$ sites (bottom) for dates approximately seven days before and following the September 2 event. The red boxes on the graph delineate the 24-hour period of the September 2 and September 4, 2017 O_3 exceedance events. Using $PM_{2.5}$ as an indicator for wildfire smoke, these graphs demonstrate the presence of smoke, supporting that wildfire smoke contributed to the elevated O_3 concentrations observed at many monitoring locations along the DM/NFR.

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Table 10: Daily 8-hour Daily Max O_3 Concentrations (ppm) - DM/NFR Sites

Date	Aspen Park	Aurora East	Boulder Reservoir	CAMP	Chatfield	La Casa	Fort Collins CSU	Fort Collins West	Greeley	Highlands	Mines Peak	NREL	Rocky Flats North	Welby	Welch
8/30/17	0.057	0.058	0.061	0.056	0.069	0.058	0.061	0.076	0.072	0.062	0.057	0.068	0.068	0.056	0.069
8/31/17	0.051	0.060	0.062	0.049	0.059	0.052	0.039	0.056	0.062	0.060	0.052	0.059	0.061	0.054	0.056
9/1/17	0.054	0.058	0.056	0.051	0.062	0.053	0.046	0.056	0.053	0.059	0.053	0.061	0.061	0.054	0.057
9/2/17	0.056	0.068	0.066	0.067	0.071	0.069	0.059	0.069	0.066	0.070	0.062	0.076	0.071	0.066	0.075
9/3/17	0.058	0.060	0.054	0.055	0.064	0.053	0.047	0.055	0.055	0.062	0.058	0.060	0.059	-	0.061
9/4/17	0.072	0.068	0.067	0.069	0.073	0.069	0.054	0.061	0.065	0.071	0.070	0.076	0.078	-	0.074
9/5/17	0.042	0.042	0.046	0.037	0.048	0.039	0.041	0.051	0.045	0.044	0.066	0.048	0.049	0.040	0.042
9/6/17	0.062	0.059	0.072	0.058	0.066	0.062	0.057	0.068	0.061	0.061	0.070	0.073	0.075	0.061	0.065
9/7/17	0.062	0.064	0.067	0.054	0.071	0.055	0.056	0.070	0.061	0.067	0.066	0.068	0.071	0.060	0.061

Note - Gray shading indicates exceptional event days
Note - Yellow shading indicates exceedance of the 2008 0.075 ppm O_3 NAAQS on exceptional event days only
Note - Blue shading indicates exceedance of the 2015 0.070 ppm O_3 NAAQS on exceptional event days only
Note - No O_3 data reported for Welby on 9/3/2017 and 9/4/2017 due to an analyzer malfunction
Note - In this exceptional event demonstration, the APCD is requesting to exclude hourly O_3 data from all Yellow and Blue shaded sites for September 2 and September 4, 2018. Exclusion of the data caused by these exceptional events, will in part, have a regulatory impact on Colorado's non-attainment re-classification from "moderate" to "serious" under the 2008 O_3 Standard.

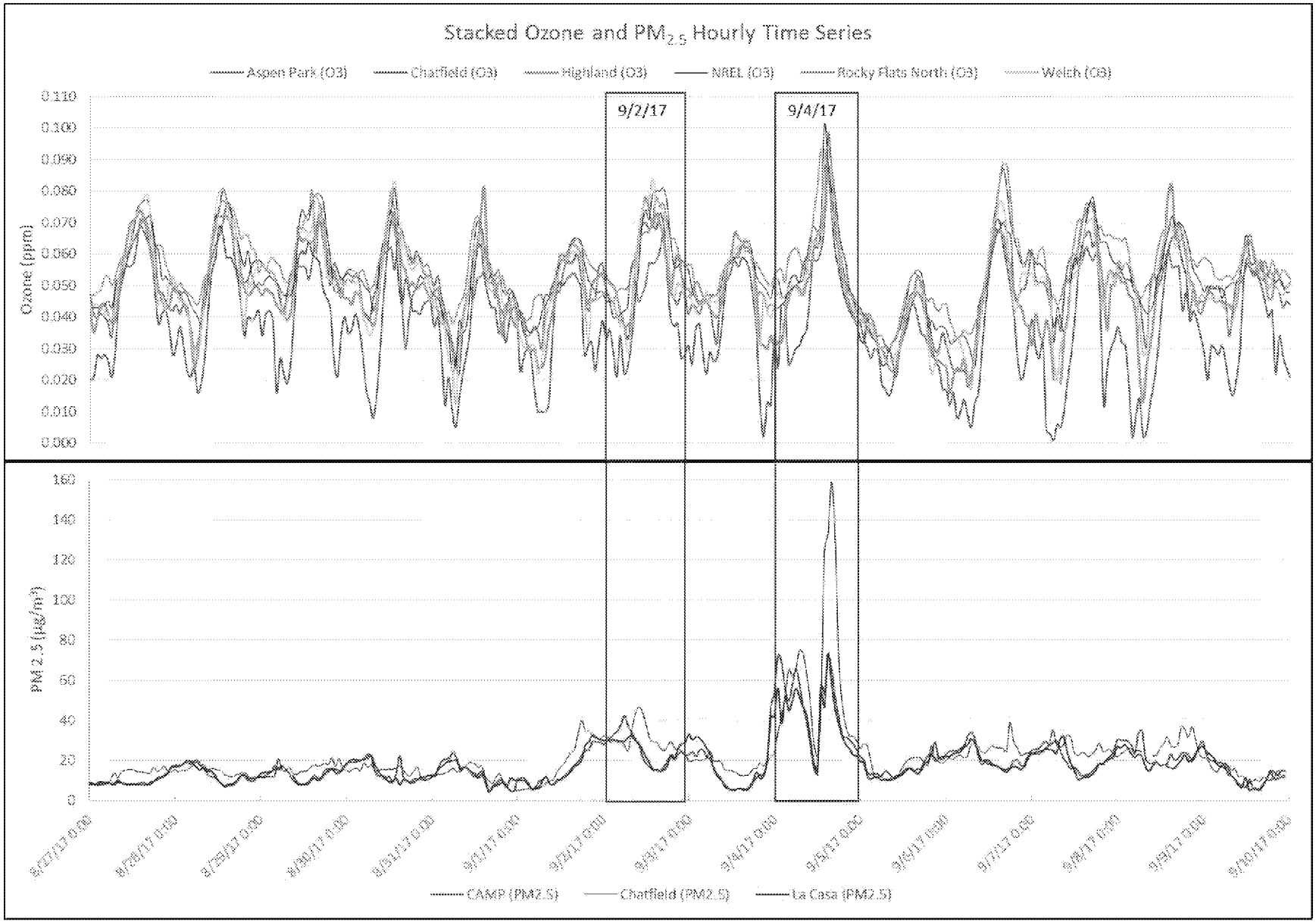


Figure 4: Stacked O_3 and $PM_{2.5}$ Hourly Time Series

3.3.2 Summary of Meteorological Conditions during Episode

An extended period of dry conditions across the western U.S. coupled with elevated temperatures and localized breezy winds created an environment conducive to dangerous fire weather and fire development during late August and early September 2017. Washington, Oregon, Idaho, and Montana received very little precipitation during the two months prior to the event, with most areas in these states receiving less than 0.5 inches of rain as presented in Figure 5 and Figure 6. Idaho and Montana experienced warmer than average temperatures by 4-10°F above normal in July 2017, and Washington and Oregon experienced warmer than average temperatures by 4-10°F above normal in August 2017 as seen in Figure 7 and Figure 8. Low precipitation and warm temperatures contributed to abnormally dry to exceptional drought conditions in the months leading up to this episode. Figure 9 illustrates the Western U.S. drought conditions just a few days prior to the event.

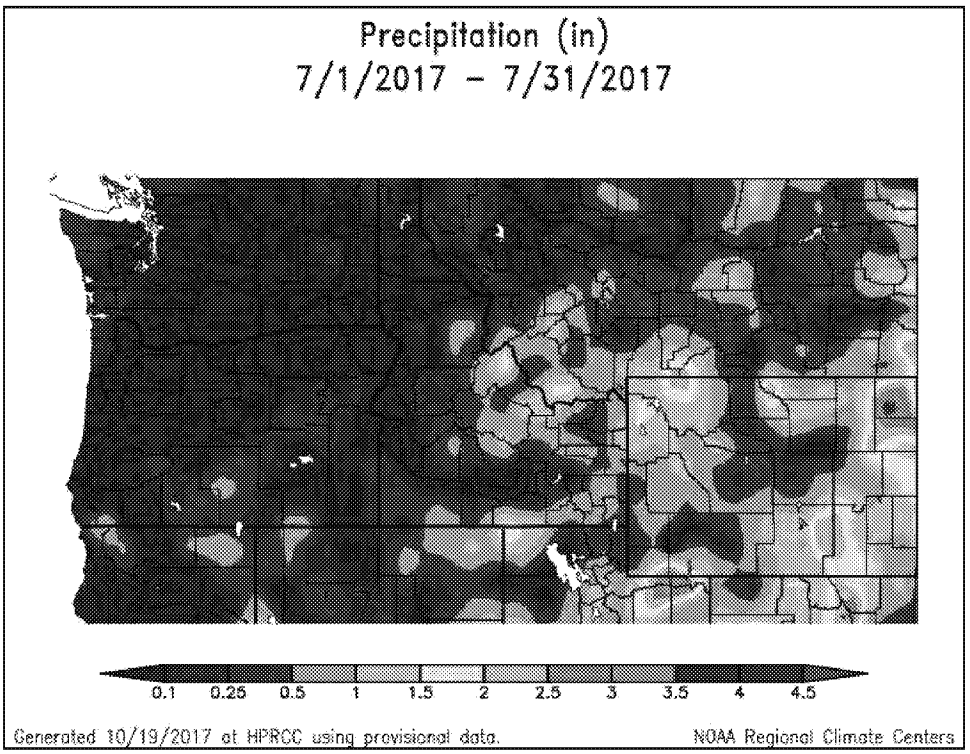


Figure 5: Total precipitation in inches, Western Regional Climate Center, northwest region, July 2017. (source: https://hprcc.unl.edu)

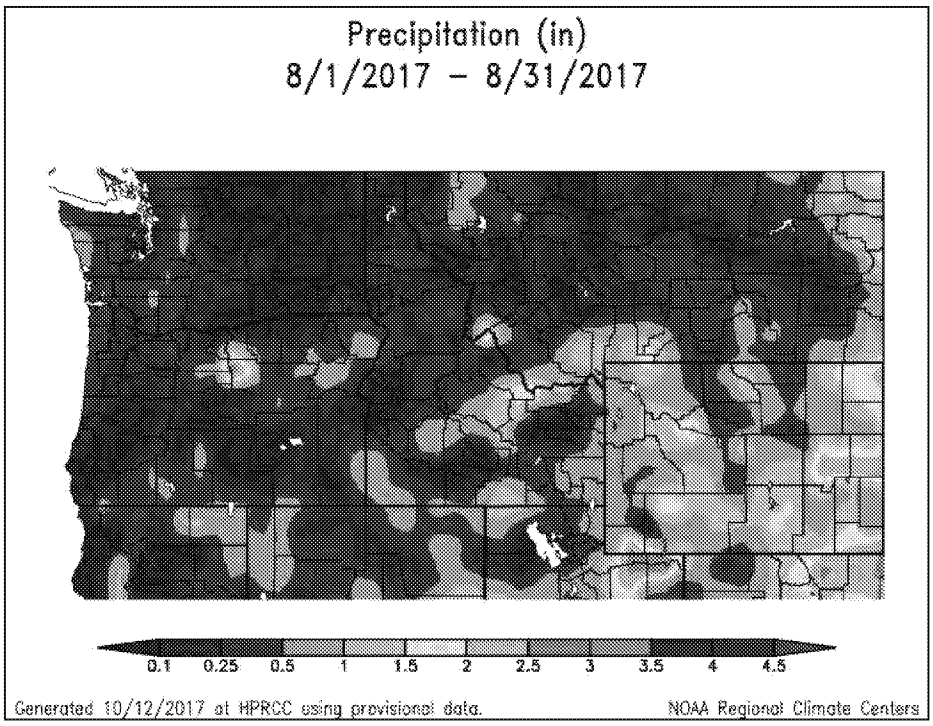


Figure 6: Total precipitation in inches, Western Regional Climate Center, northwest region, August 2017. (source: https://hprcc.unl.edu)

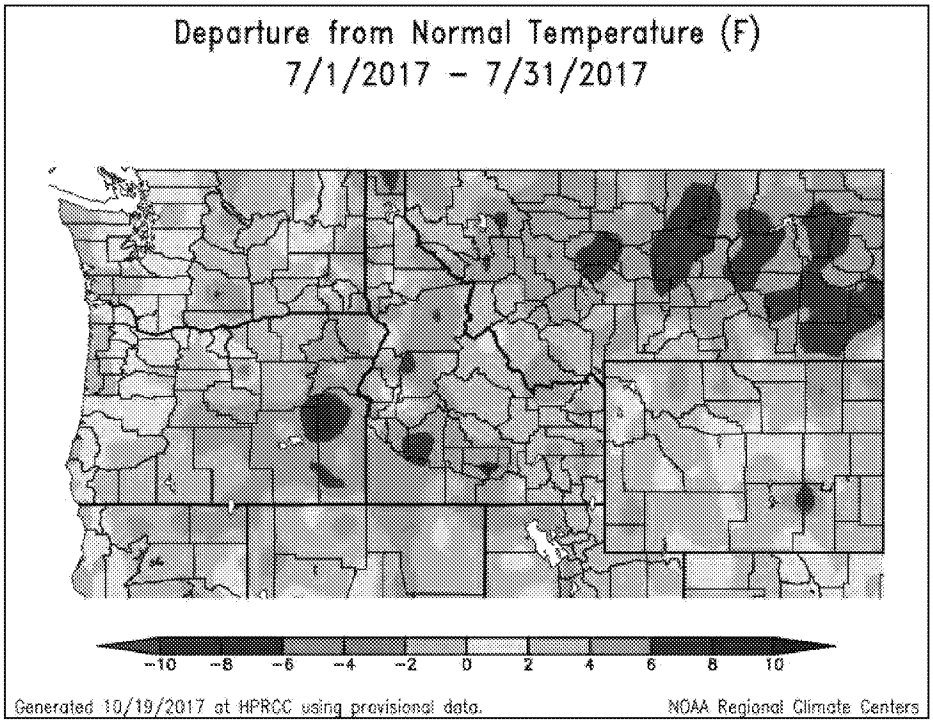


Figure 7: Departure from normal temperature (degrees Fahrenheit), Western Regional Climate Center, northwest region, July 2017. (source: https://hprcc.unl.edu)

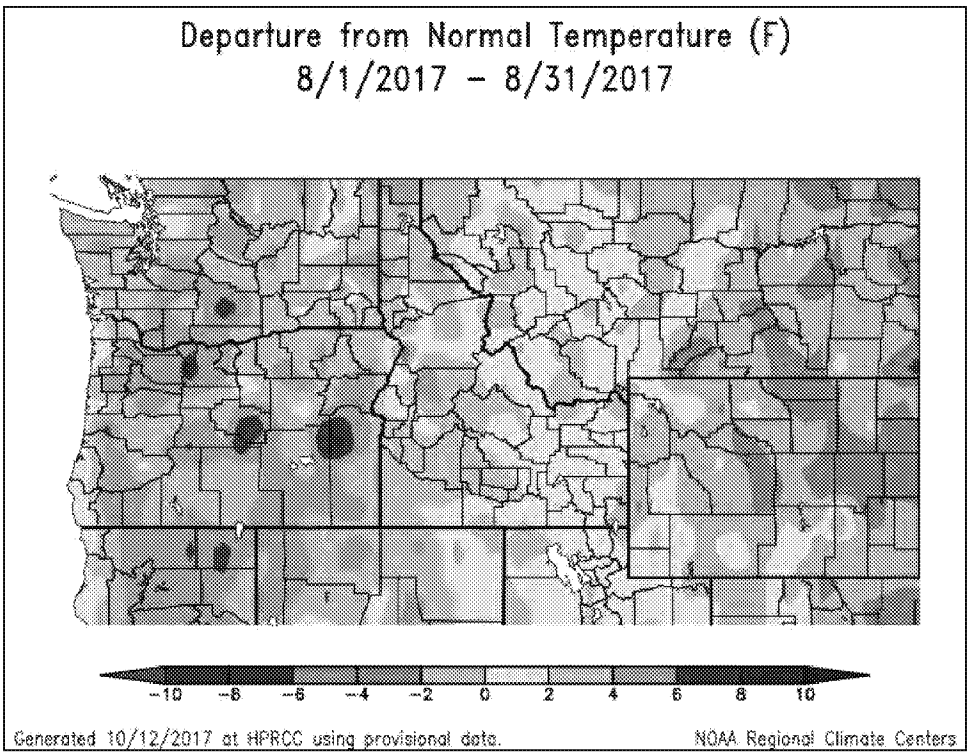
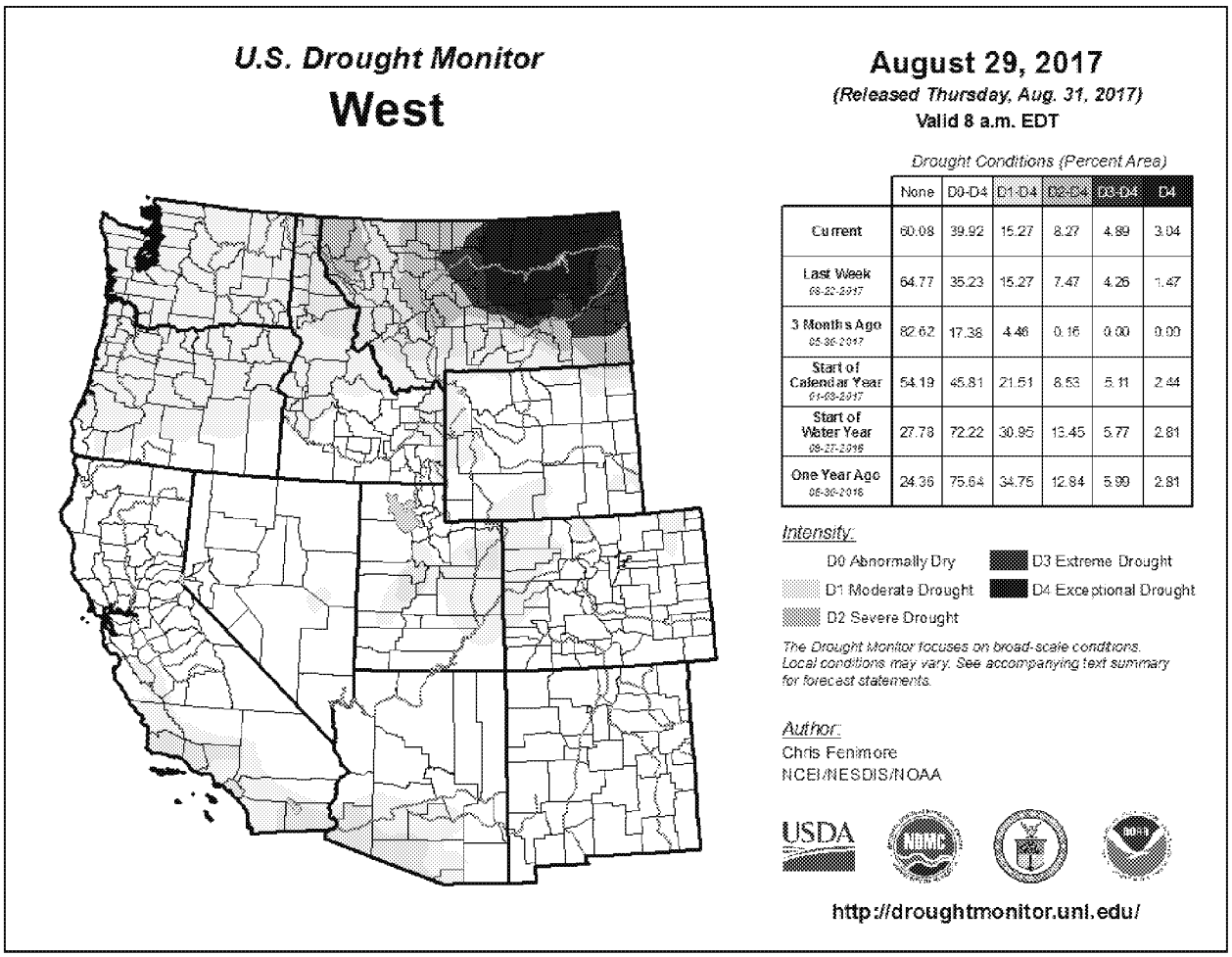


Figure 8: Departure from normal temperature (degrees Fahrenheit), Western Regional Climate Center, northwest region, August 2017. (source: https://hprcc.unl.edu)



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	60.08	39.92	15.27	8.27	4.89	3.04
Last Week 08-22-2017	64.77	35.23	15.27	7.47	4.26	1.47
3 Months Ago 05-30-2017	82.62	17.38	4.46	0.16	0.00	0.00
Start of Calendar Year 01-03-2017	54.19	45.81	21.51	8.53	5.11	2.44
Start of Water Year 09-27-2016	27.78	72.22	30.95	13.45	5.77	2.81
One Year Ago 08-30-2016	24.36	75.64	34.76	12.84	5.99	2.81

Figure 9: Drought conditions for the western U.S. at 5:00 AM MST August 29, 2017. (source: http://droughtmonitor.unl.edu)

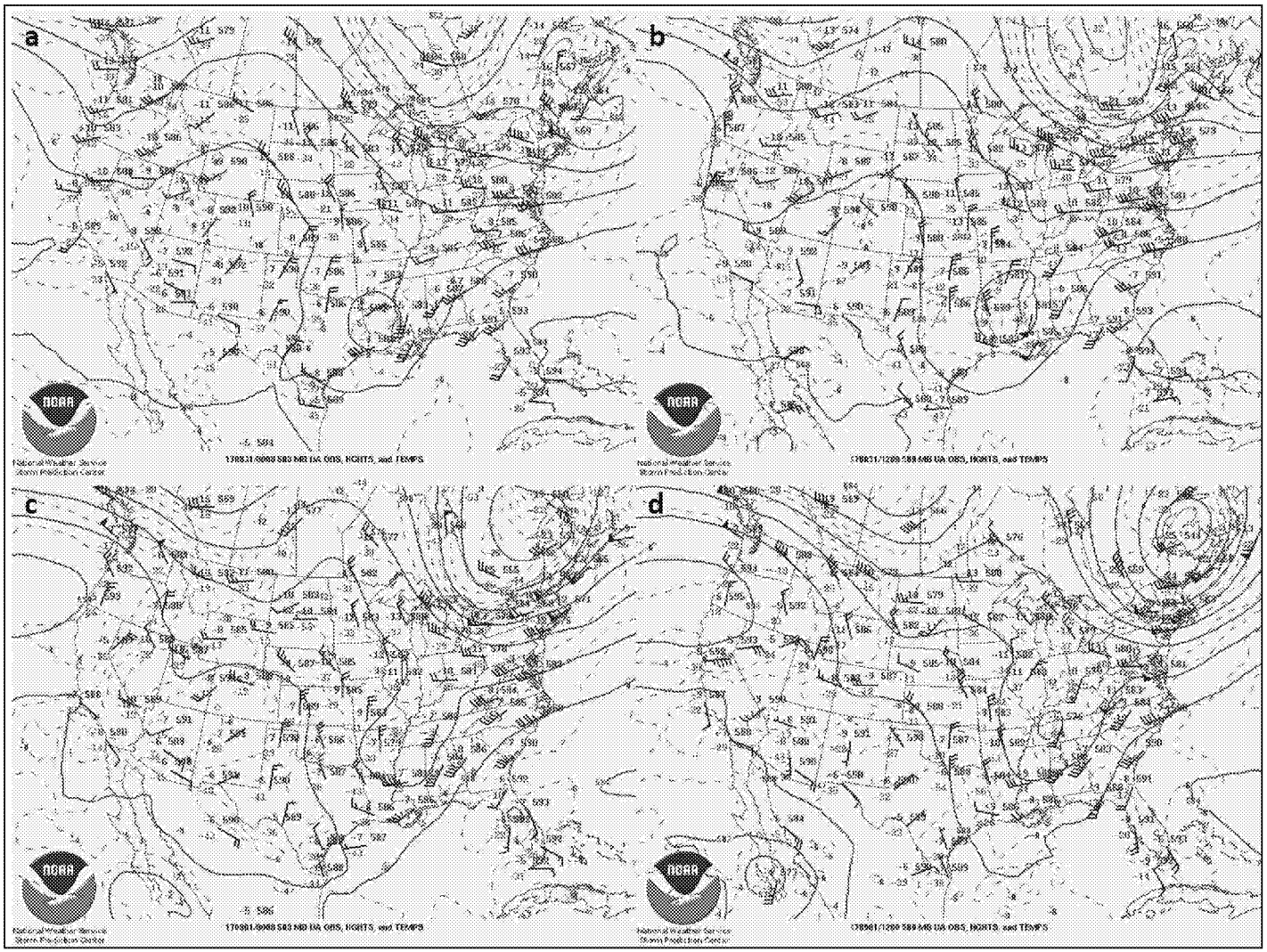
A large upper-level ridge of high pressure centered over the western US is shown on the 500 millibars (mb) height analysis maps starting at 5:00 PM MST (0Z August 31, 2017) on August 30, 2017, and largely persists as shown in sequential maps every 12 hours through 5:00 PM MST (0Z September 5, 2017) on September 4, 2017, in Figures 10a-k. The 500 mb level is located roughly 6 kilometers above mean sea level. Initially, a short-wave trough of low pressure over the Pacific Northwest moved through the predominant ridge on August 31 (Figures 10a-b). As this short-wave trough moved eastward the ridge of high pressure re-strengthened over the entire western U.S. during September 1, 2017 (Figures 10c-f), the trough became well established within the upper-level flow, transport, and circulation by September 3, 2017 through September 4, 2017 (Figures 10g-k). Strong and steady west to northwest winds (~50 knots) in the mid to upper levels of the atmosphere acted as a conveyor

belt, steering air from the Pacific Northwest and northern Rocky Mountains to the DM/NFR area.

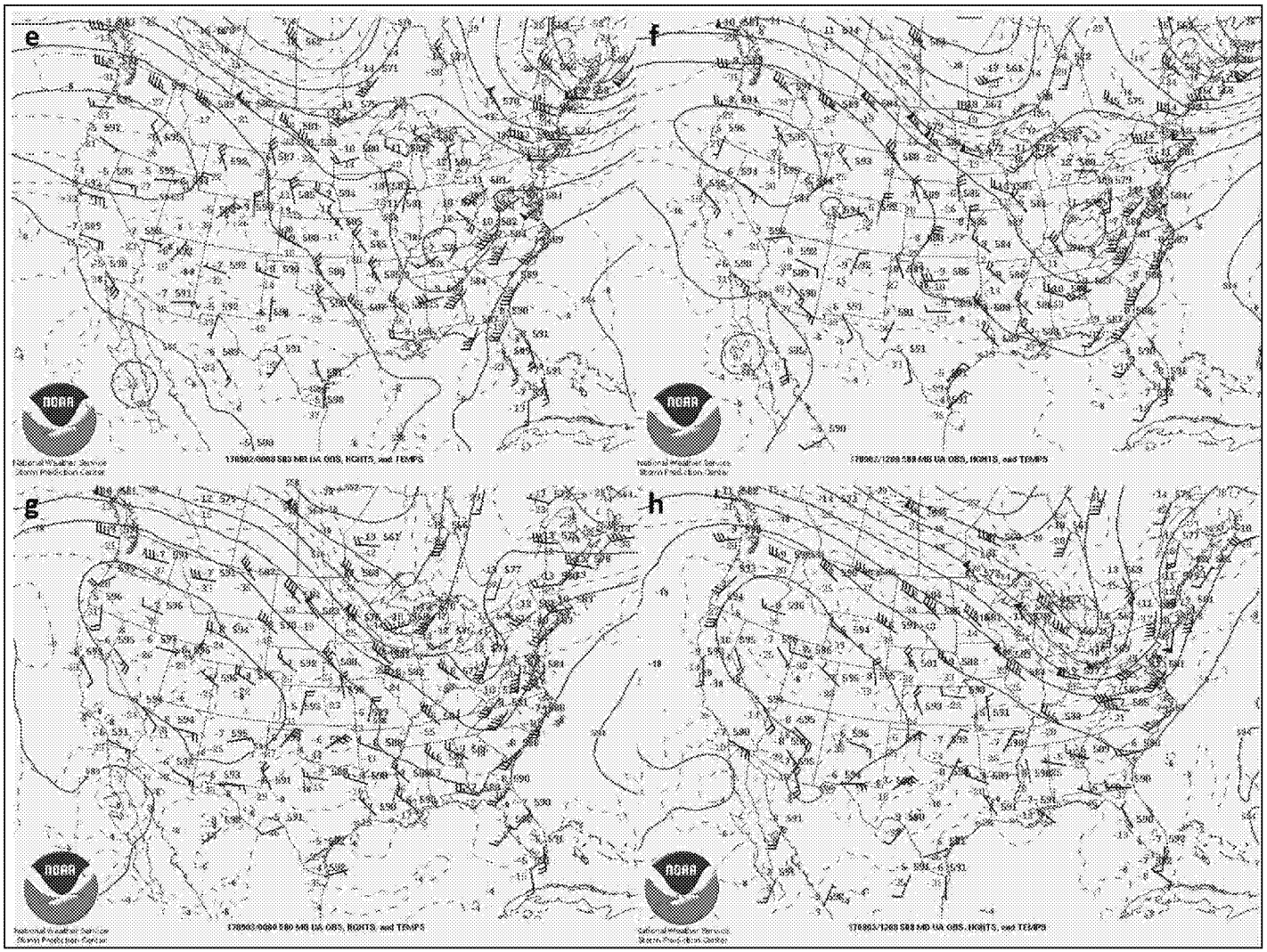
The mid to upper-level wind influence in atmospheric circulation is evident in Moderate Resolution Imaging Spectroradiometer (MODIS) Terra True Color Satellite imagery during August 31 - September 4, 2017, as seen in Figure 11a-e. Visible smoke from fires in the Pacific Northwest and northern Rocky Mountains region transported during this time period correlated with the mostly persistent 500 mb weather pattern shown in Figures 10.

Although the mid to upper level winds were the primary transport mechanism of wildfire smoke to the Denver Metro Area, surface level winds were also favorable for ground level smoke transport. The surface weather associated with this pattern is presented in Figures 12a-k, with surface analyses starting at 5:00 PM MST (0Z August 31, 2017) August 30, 2017 and progressing every 12 hours through 5:00 PM MST (0Z September 5, 2017) September 4, 2017. A cold front pushed southeast from the Pacific Northwest into Idaho, Montana, and eventually the Dakotas during August 31, 2017 and into September 1, 2017 (Figures 12a-d). By early in the day of September 2, 2017, a stationary front developed over the Montana-Canadian border (Figure 12f). This stationary front gradually transitioned into a cold front as it moved south from Montana and Wyoming late on September 3, 2017, quickly progressing south through eastern Colorado and into Oklahoma by evening on September 4, 2017 (Figures 12i-k). The common theme of the surface pattern during this episode was a fairly persistent west-northwesterly surface wind flow (Figures 13a-e). This allowed air containing heavy smoke from the wildfire locations to periodically be transported into the DM/NFR area during this episode.

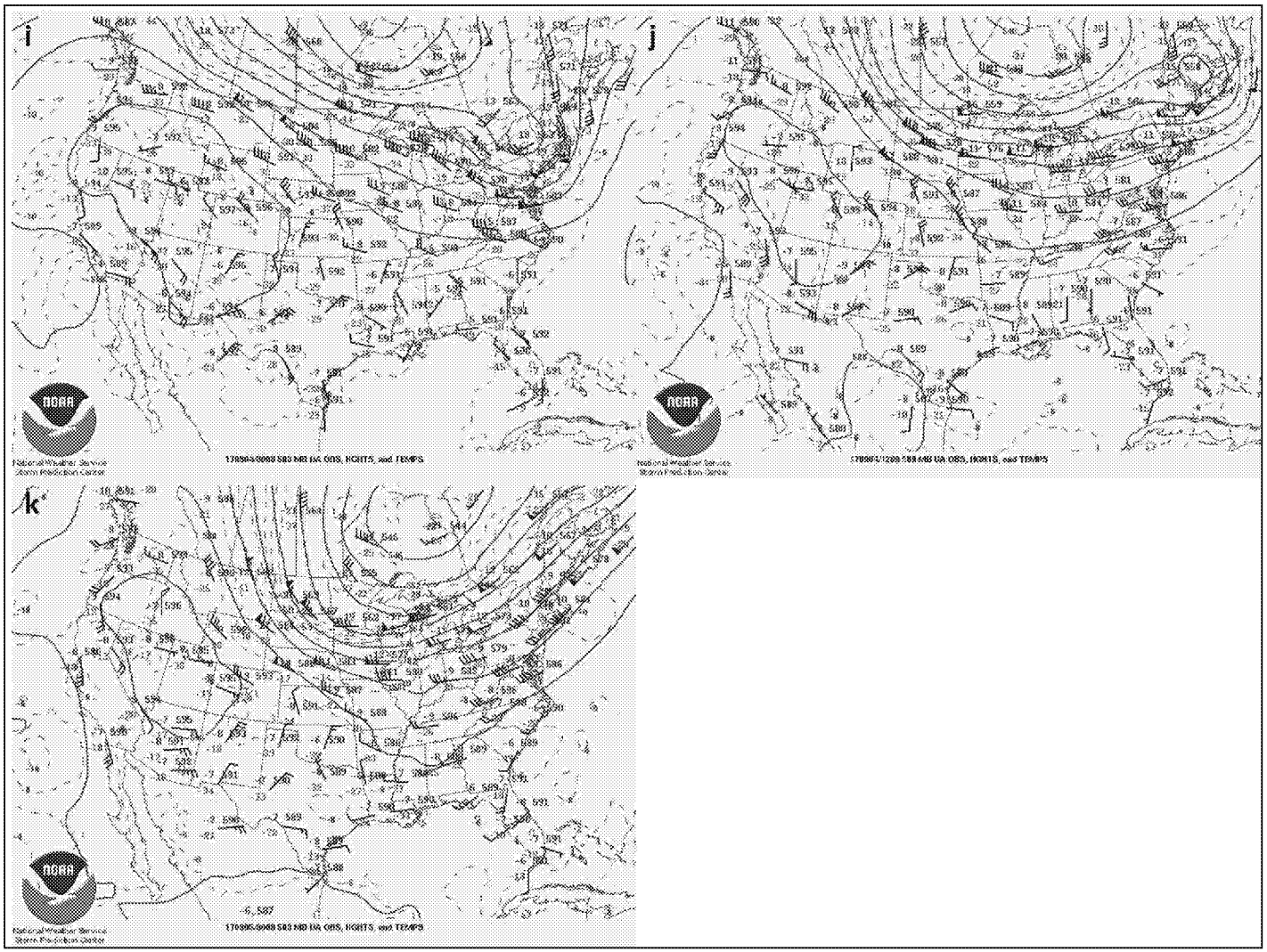
The combination of hot temperatures and extremely dry conditions set the stage for wildfires to increase significantly across the Pacific Northwest and northern Rockies in July and August of 2017. The persistent mid to upper level weather pattern with gusty surface winds allowed smoke production at the wildfires to continue, and provided a mechanism for long-range smoke transport from the Pacific Northwest and northern Rockies into the DM/NFR area during early September of 2017.



Figures 10a-d: NOAA 500 mb height and wind analysis at (a) 5:00 PM MST (0Z August 31, 2017) August 30, 2017; (b) 5:00 AM MST (12Z) August 31, 2017; (c) 5:00 PM MST (0Z September 1, 2017) August 31, 2017; and (d) 5:00 AM MST (12Z) September 1, 2017. (source: http://www.spc.noaa.gov/)



Figures 10e-h: NOAA 500 mb height and wind analysis at (e) 5:00 PM MST (0Z September 2, 2017) September 1, 2017; (f) 5:00 AM MST (12Z) September 2, 2017; (g) 5:00 PM MST (0Z September 3, 2017) September 2, 2017; and (d) 5:00 AM MST (12Z) September 3, 2017. (source: http://www.spc.noaa.gov/)



Figures 10i-k: NOAA 500 mb height and wind analysis at (i) 5:00 PM MST (0Z September 4, 2017) September 3, 2017; (j) 5:00 AM MST (12Z) September 4, 2017; (k) 5:00 PM MST (0Z September 5, 2017) September 4, 2017.
(source: http://www.spc.noaa.gov/)

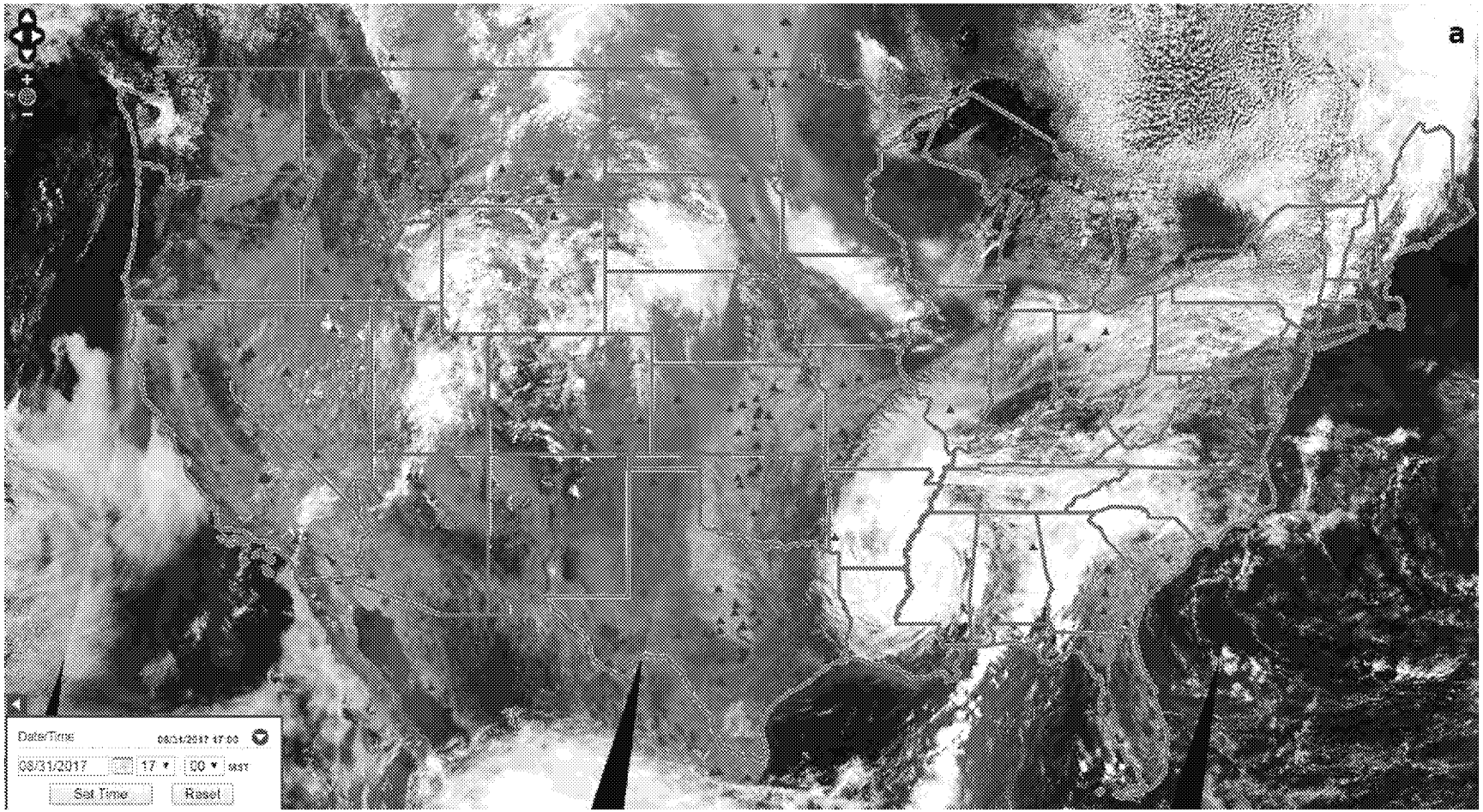


Figure 11a: MODIS Terra True Color satellite image with HMS Fire detection at 5:00 PM MST on August 31, 2017. (source: https://airnowtech.org/navigator)

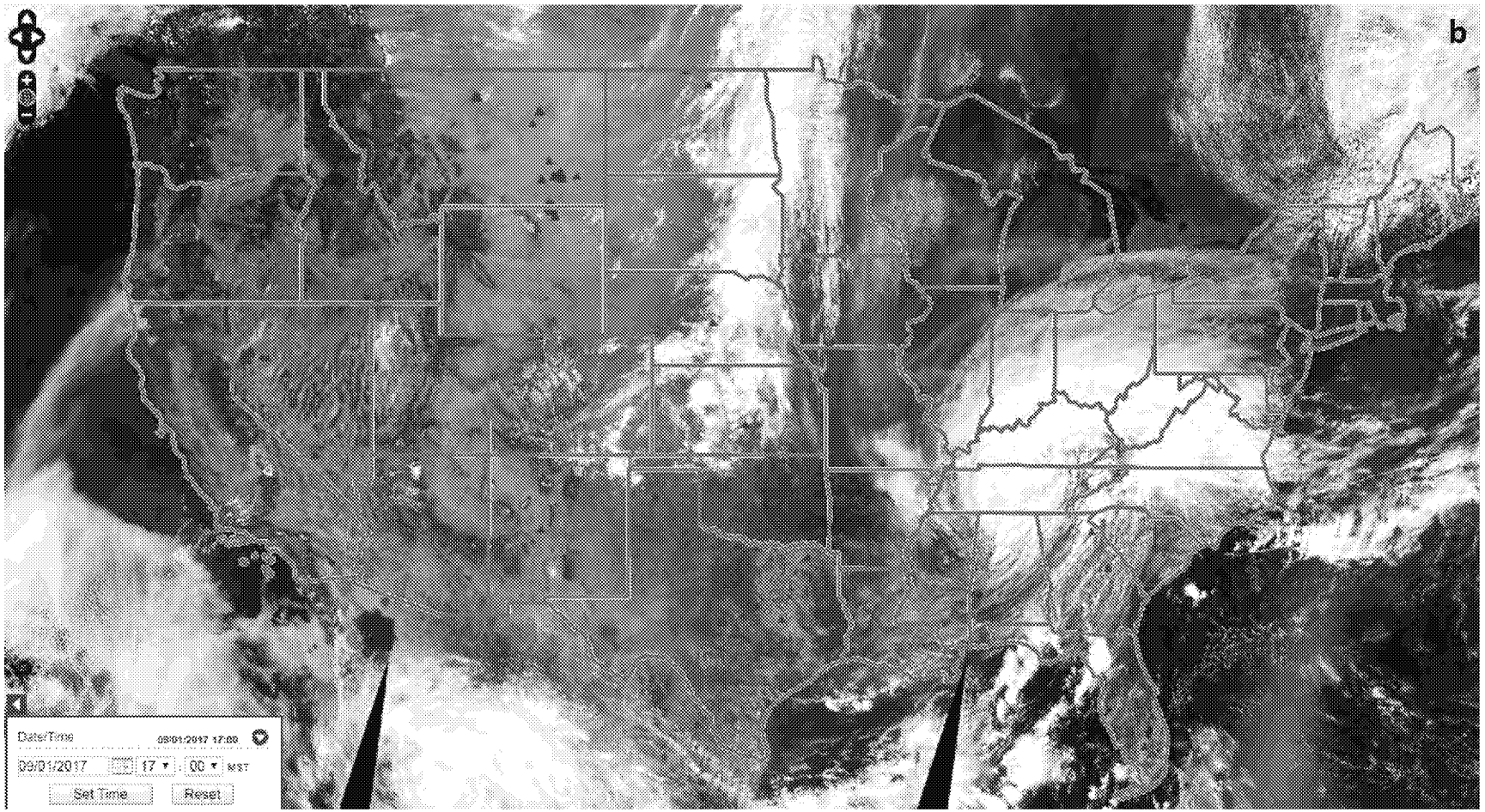


Figure 11b: MODIS Terra True Color satellite image with HMS Fire detection at 5:00 PM MST on September 1, 2017. (source: https://airnowtech.org/navigator)

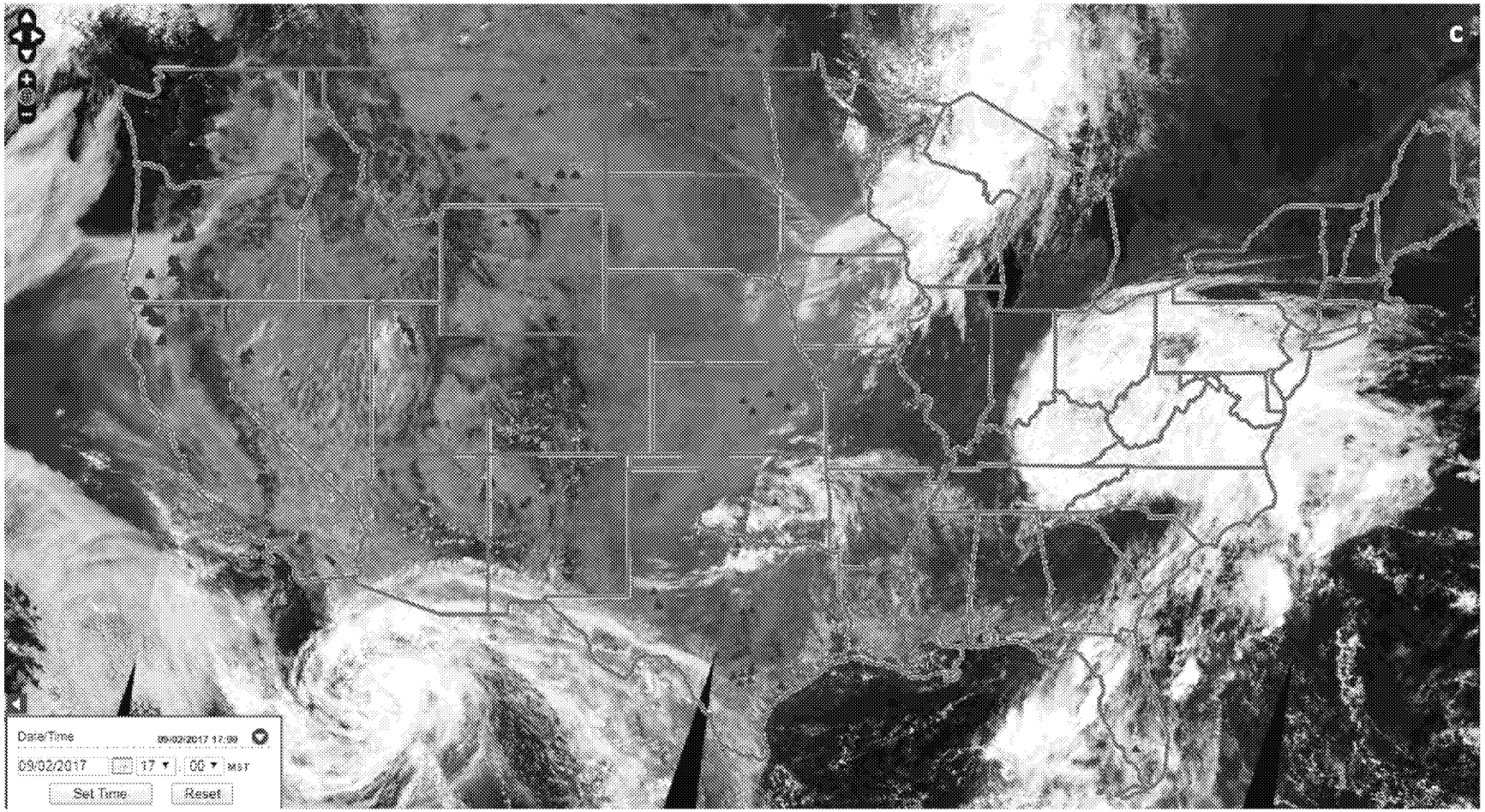


Figure 11c: MODIS Terra True Color satellite image with HMS Fire detection at 5:00 PM MST on September 2, 2017. (source: https://airnowtech.org/navigator)

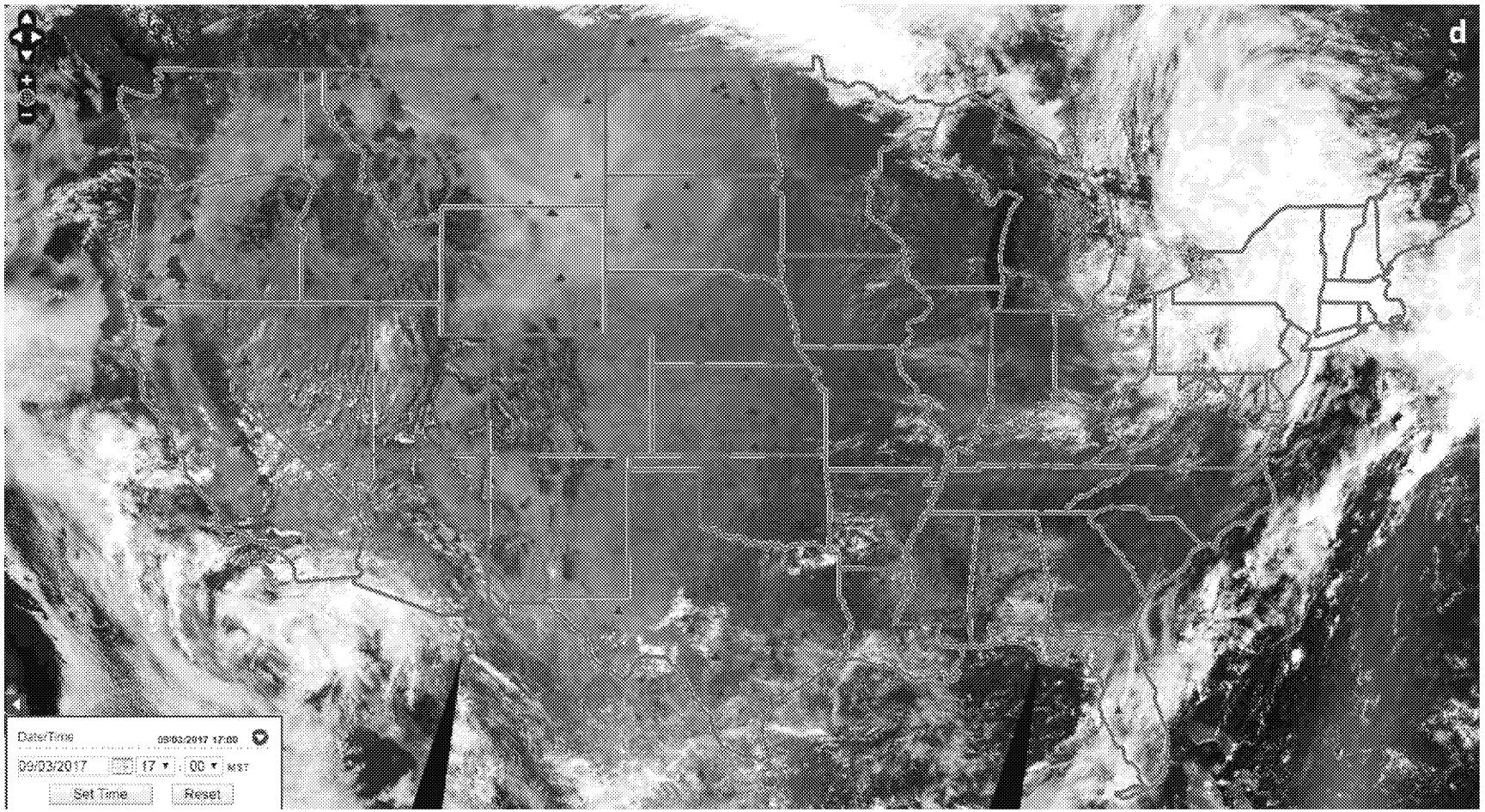


Figure 11d: MODIS Terra True Color satellite image with HMS Fire detection at 5:00 PM MST on September 3, 2017. (source: https://airnowtech.org/navigator)

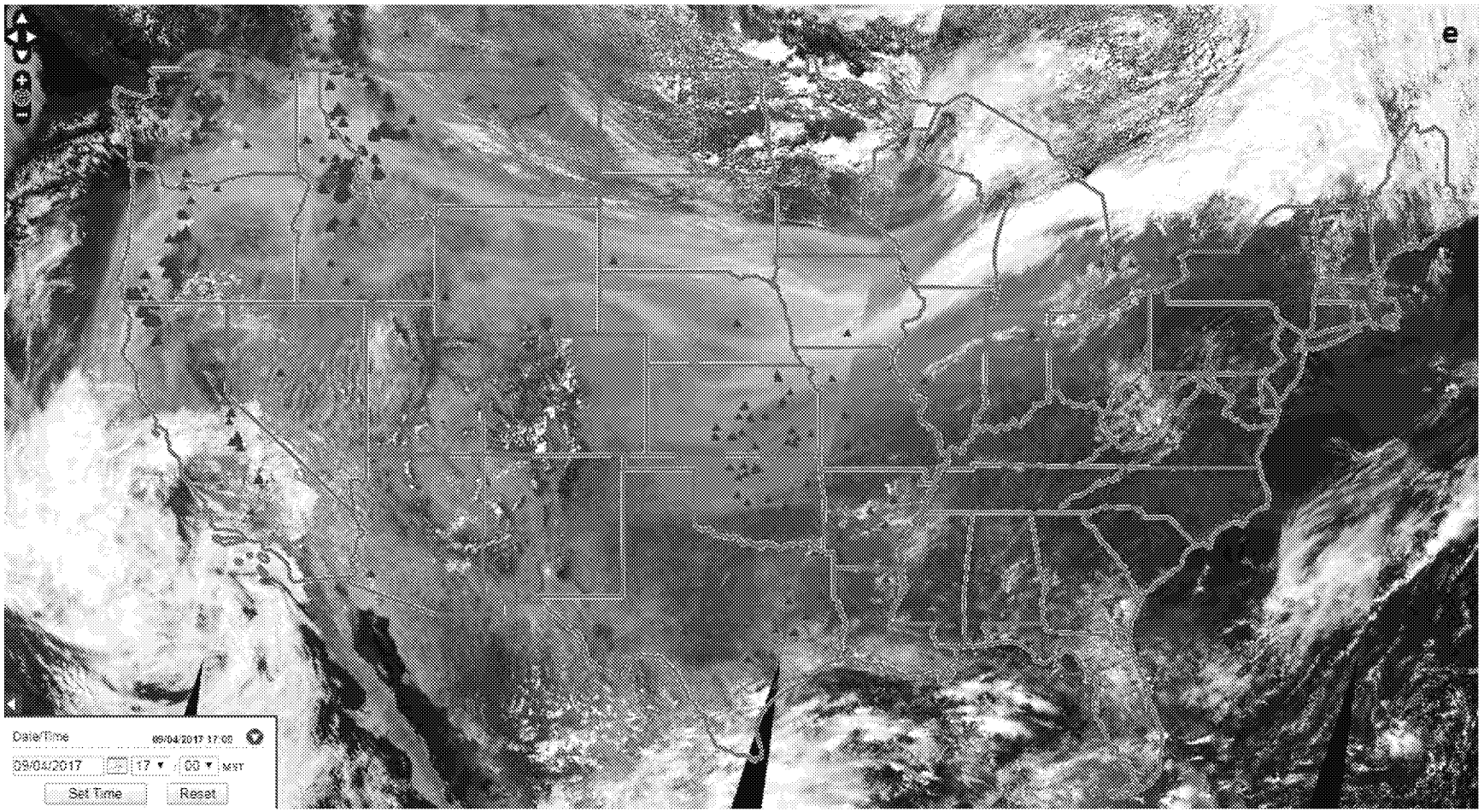
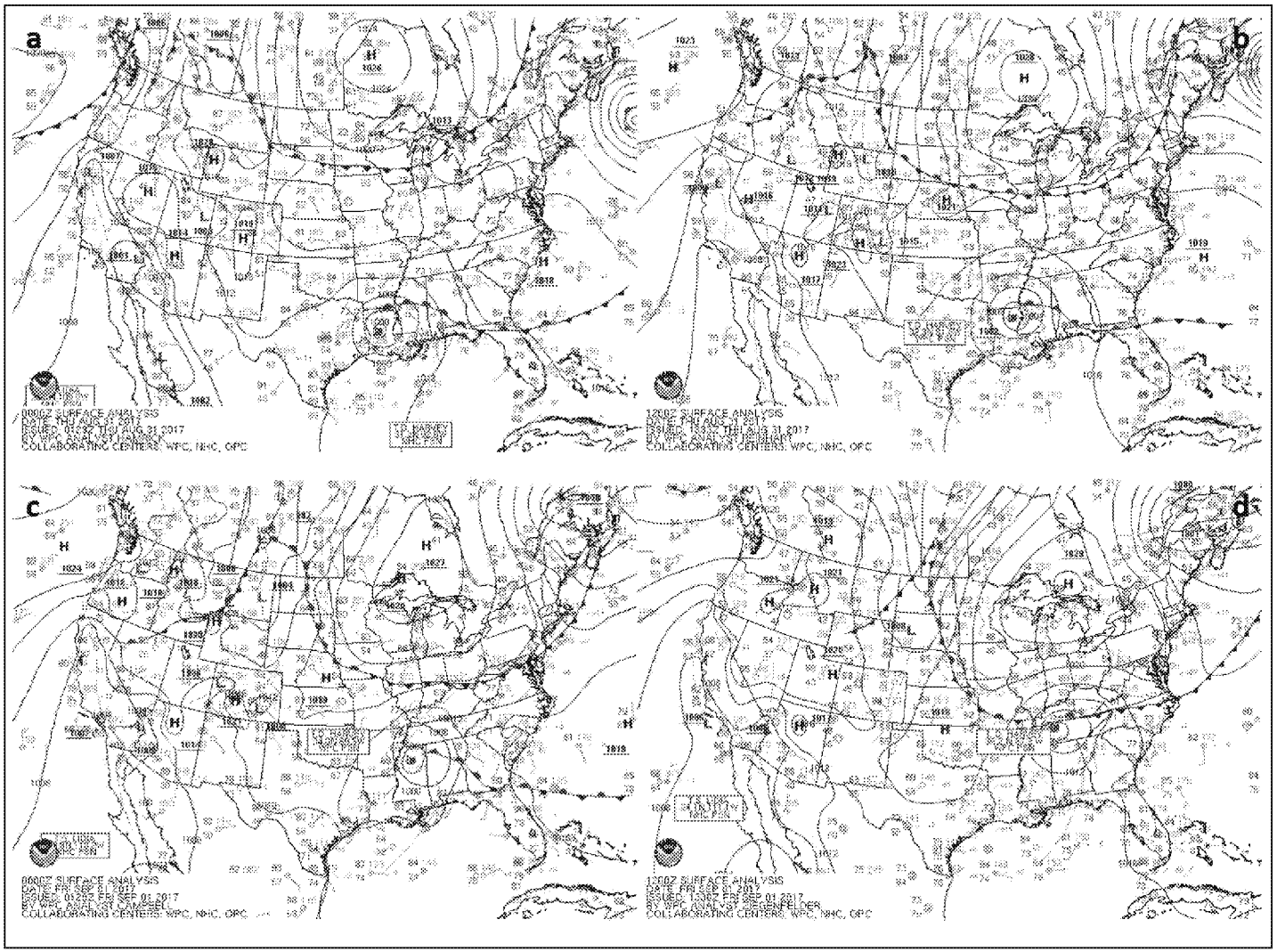
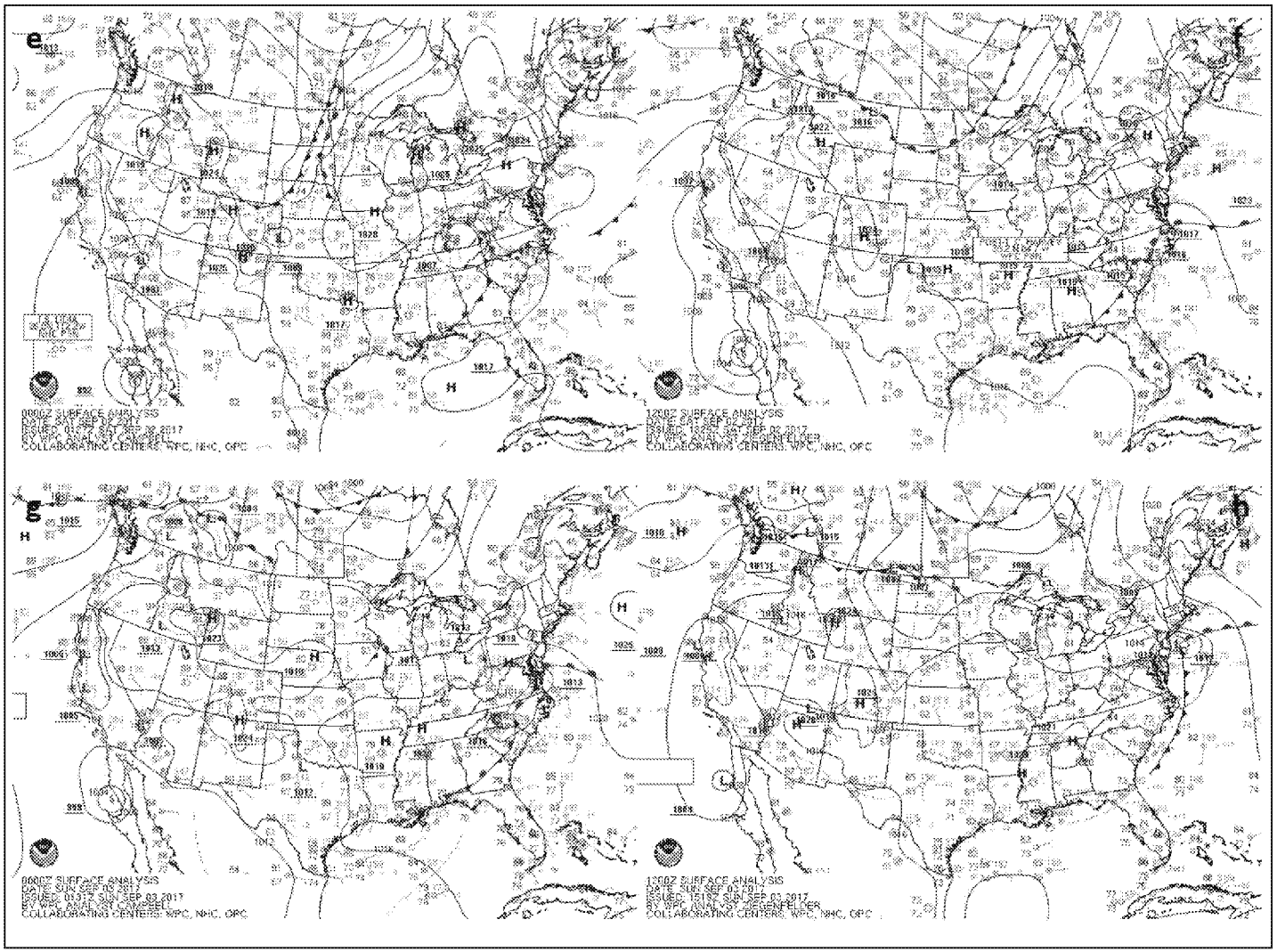


Figure 11e: MODIS Terra True Color satellite image with HMS Fire detection at 5:00 PM MST on September 4, 2017. (source: https://airnowtech.org/navigator)

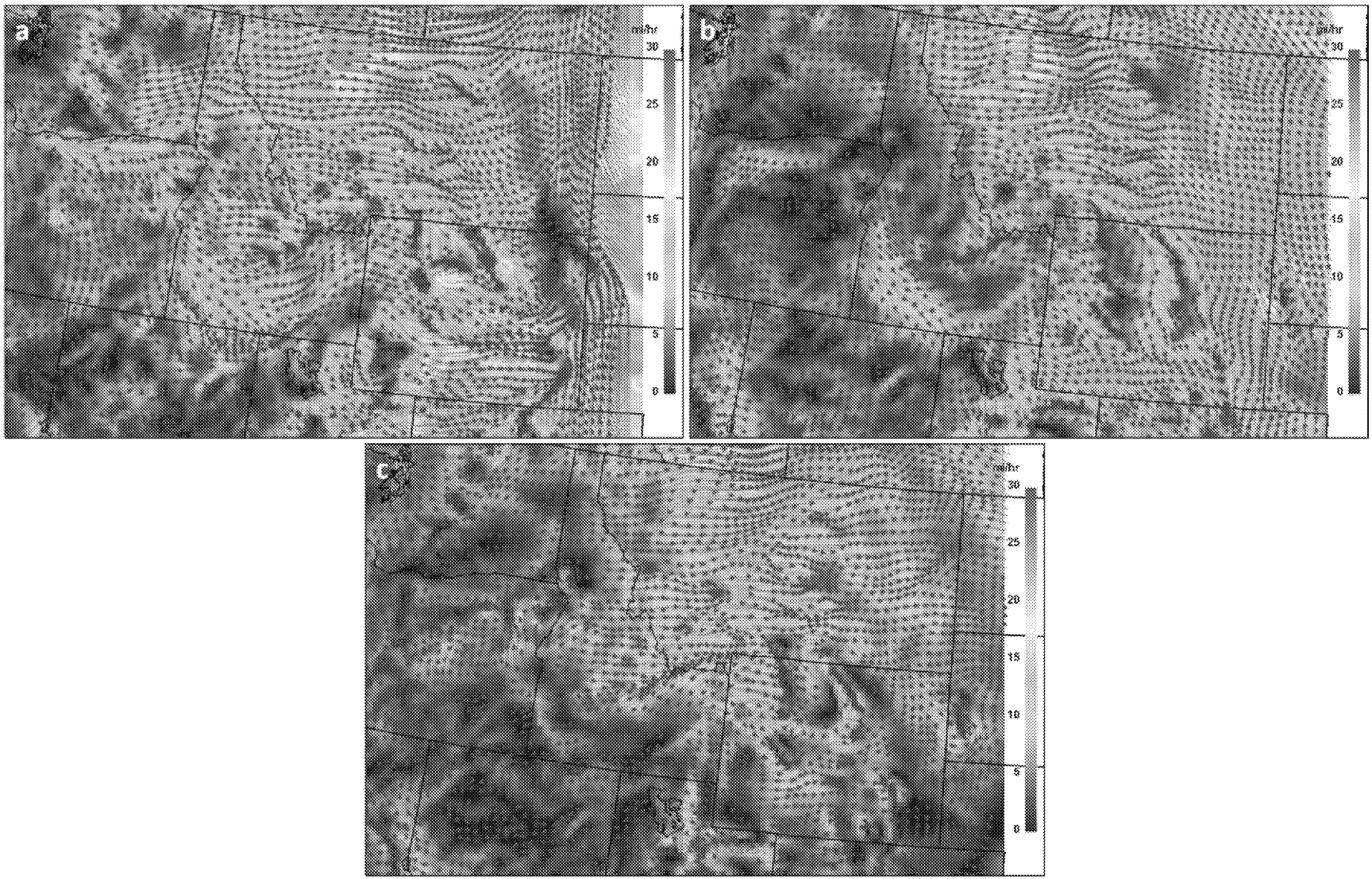


Figures 12a-d: NOAA surface analysis at (a) 5:00 PM MST (0Z August 31, 2017) August 30, 2017; (b) 5:00 AM MST (12Z) August 31, 2017; (c) 5:00 PM MST (0Z September 1, 2017) August 31, 2017; and (d) 5:00 AM MST (12Z) September 1, 2017. (source: http://www.wpc.ncep.noaa.gov/)

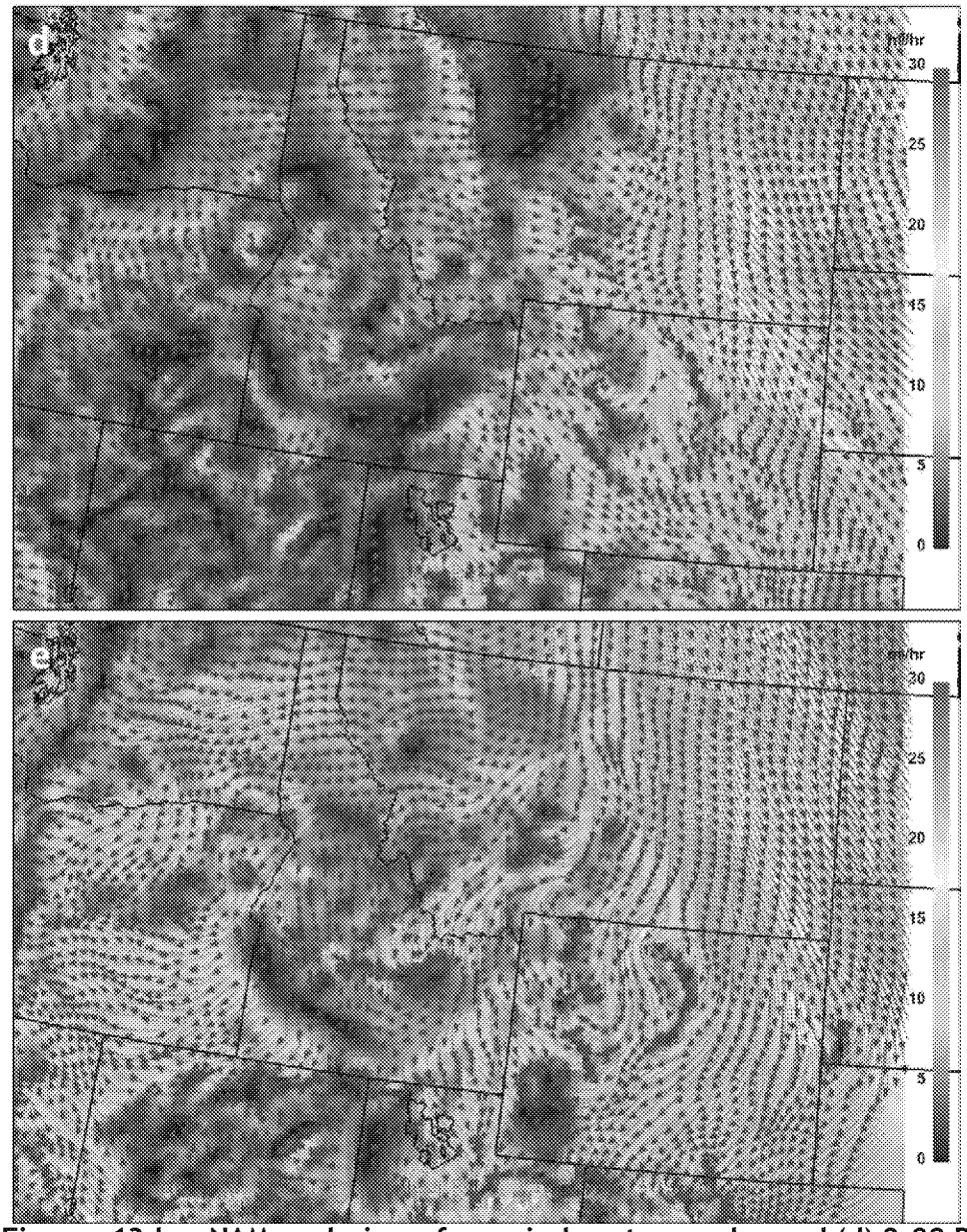


Figures 12e-h: NOAA surface analysis at (e) 5:00 PM MST (0Z September 2, 2017) September 1, 2017; (f) 5:00 AM MST (12Z) September 2, 2017; (g) 5:00 PM MST (0Z September 3, 2017) September 2, 2017; and (h) 5:00 AM MST (12Z) September 3, 2017. (source: http://www.wpc.ncep.noaa.gov/)

Figures 12i-k: NOAA surface analysis at (i) 5:00 PM MST (0Z September 4, 2017) September 3, 2017; (j) 5:00 AM MST (12Z) September 4, 2017; (k) 5:00 PM MST (0Z September 5, 2017) September 4, 2017. (source: http://www.wpc.ncep.noaa.gov/)



Figures 13a-c: NAM analysis surface wind vectors and speed for (a) 2:00 PM MST (21Z) August 31, 2017, (b) 2:00 PM MST (21Z) September 1, 2017, (c) 2:00 PM MST (21Z) September 2, 2017.
(source: https://nomads.ncdc.noaa.gov/thredds/catalog.html).



Figures 13d-e: NAM analysis surface wind vectors and speed (d) 2:00 PM MST (21Z) September 3, 2017, and (e) 2:00 PM MST (21Z) September 4, 2017. (source: https://nomads.ncdc.noaa.gov/thredds/catalog.html).

3.3.3 Summary of Wildfire Conditions during Episode

The conditions during the summer months of 2017 described in Section 3.3.2 resulted in above normal, significant wildland fire potential across the northwestern U.S. for August and September 2017 (Figure 14 and Figure 15). This fire potential manifested due to the surface and upper level weather during this episode. As fire weather and fire danger increased, fires grew in size and reports of smoke and new fires increased throughout the week surrounding

this exceptional event. Hazard Mapping System (HMS) Smoke and Fire detection for August 31 through September 4, 2017 are presented in Figure 16a-e. From this evidence, it is clear fires were numerous and resultant smoke widespread during this time period. Figure 17a-e shows 8-hr maximum O_3 concentrations and Figure 18a-e displays 24-hr average $PM_{2.5}$ concentrations for each day during this window, illustrating extreme concentrations of $PM_{2.5}$ in smoke plumes and elevated O_3 in regions with dispersed/aged smoke.

During the 7-day window from August 30-September 5, 2017, 926,198 acres burned in the quadrant of the U.S. to the west and north of the DM/NFR area, with several large fires crossing the threshold of over 100,000 acres to become mega fires.

Figure 14: Significant Wildland Fire Potential Outlook for August 2017. (source: https://www.predictiveservices.nifc.gov)

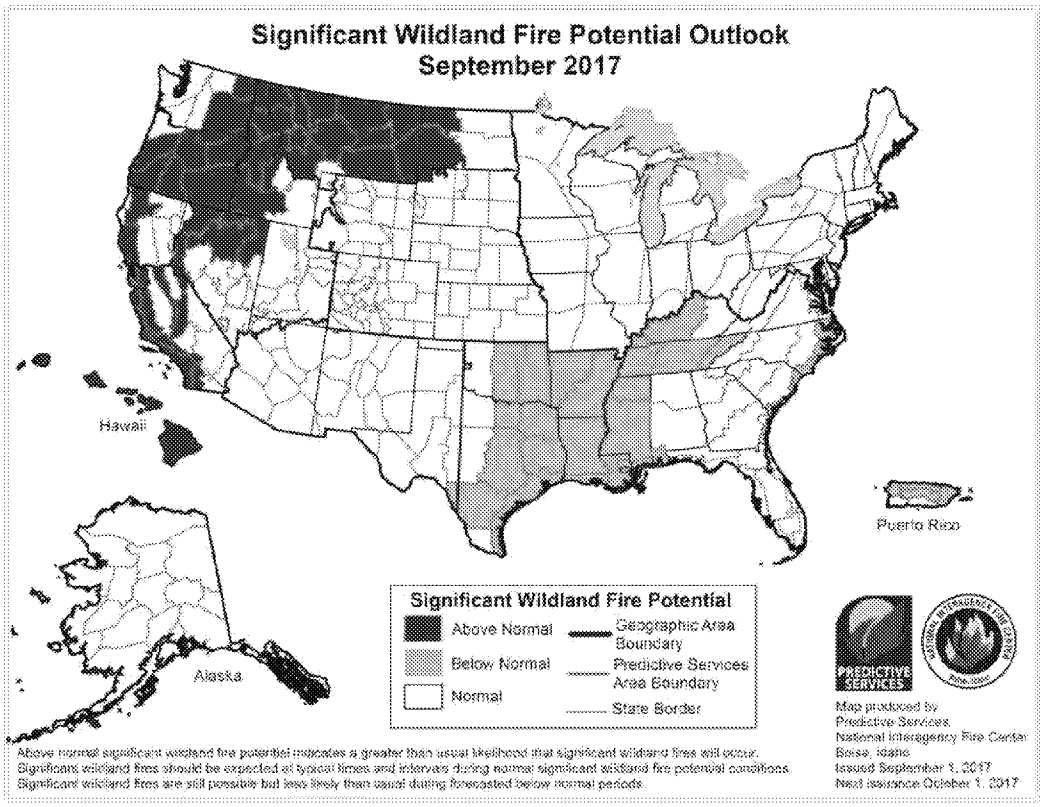


Figure 15: Significant Wildland Fire Potential Outlook for September 2017. (source: https://www.predictiveservices.nifc.gov)

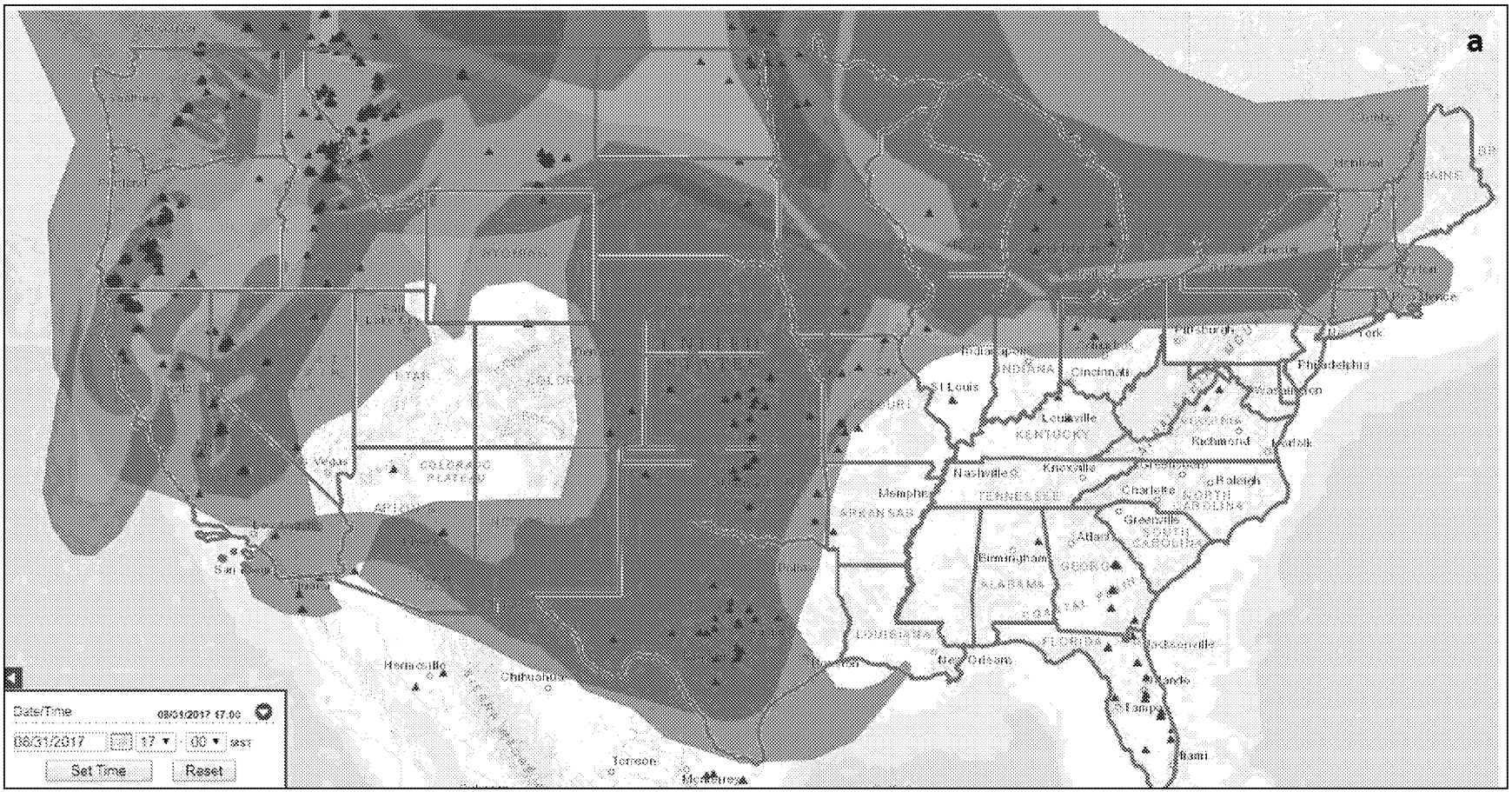


Figure 16a: HMS Fire and Smoke detection at 5:00 PM MST on August 31, 2017. (source: https://airnowtech.org/navigator)

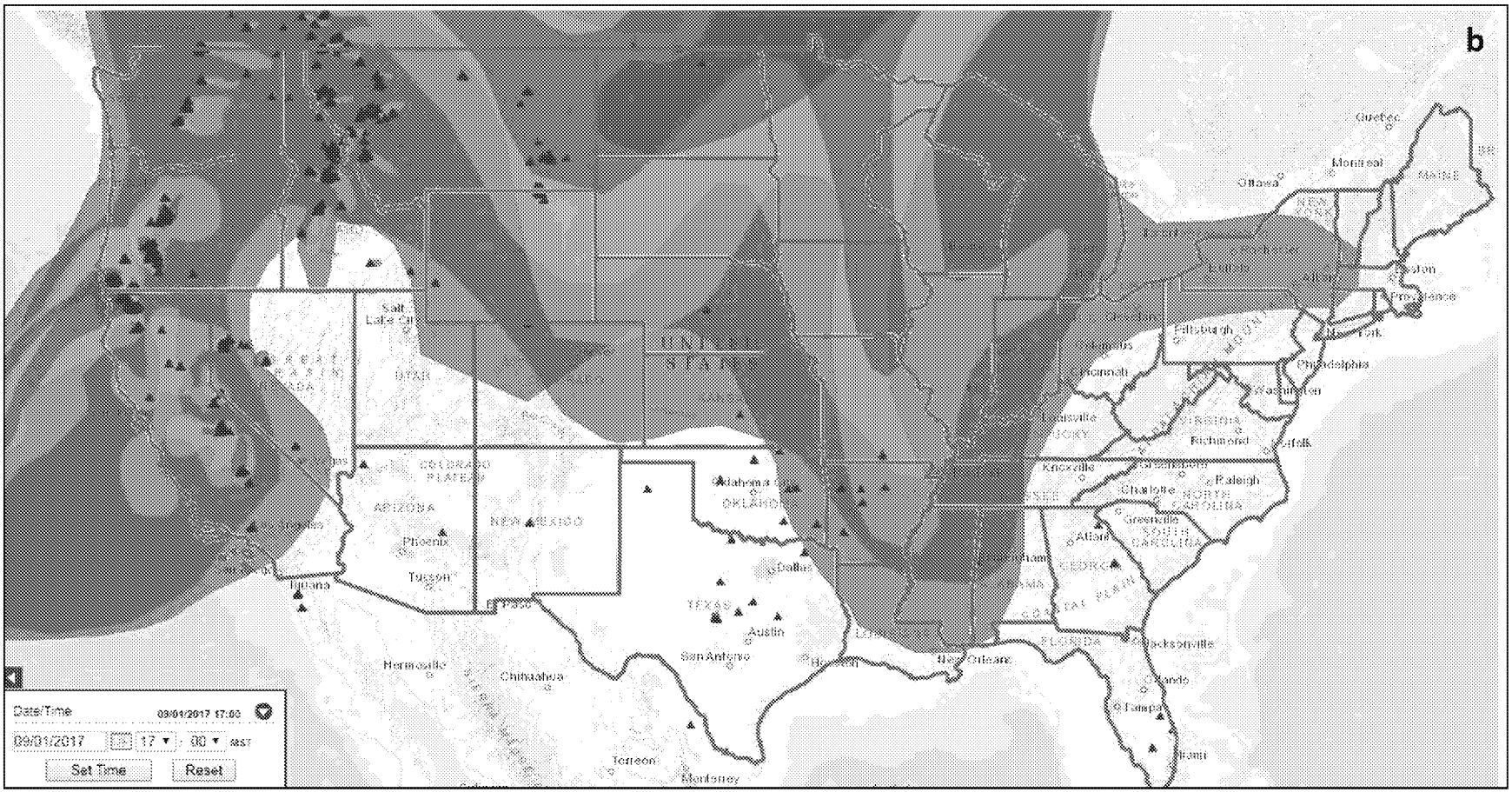


Figure 16b: HMS Fire and Smoke detection at 5:00 PM MST on September 1, 2017. (source: https://airnowtech.org/navigator)

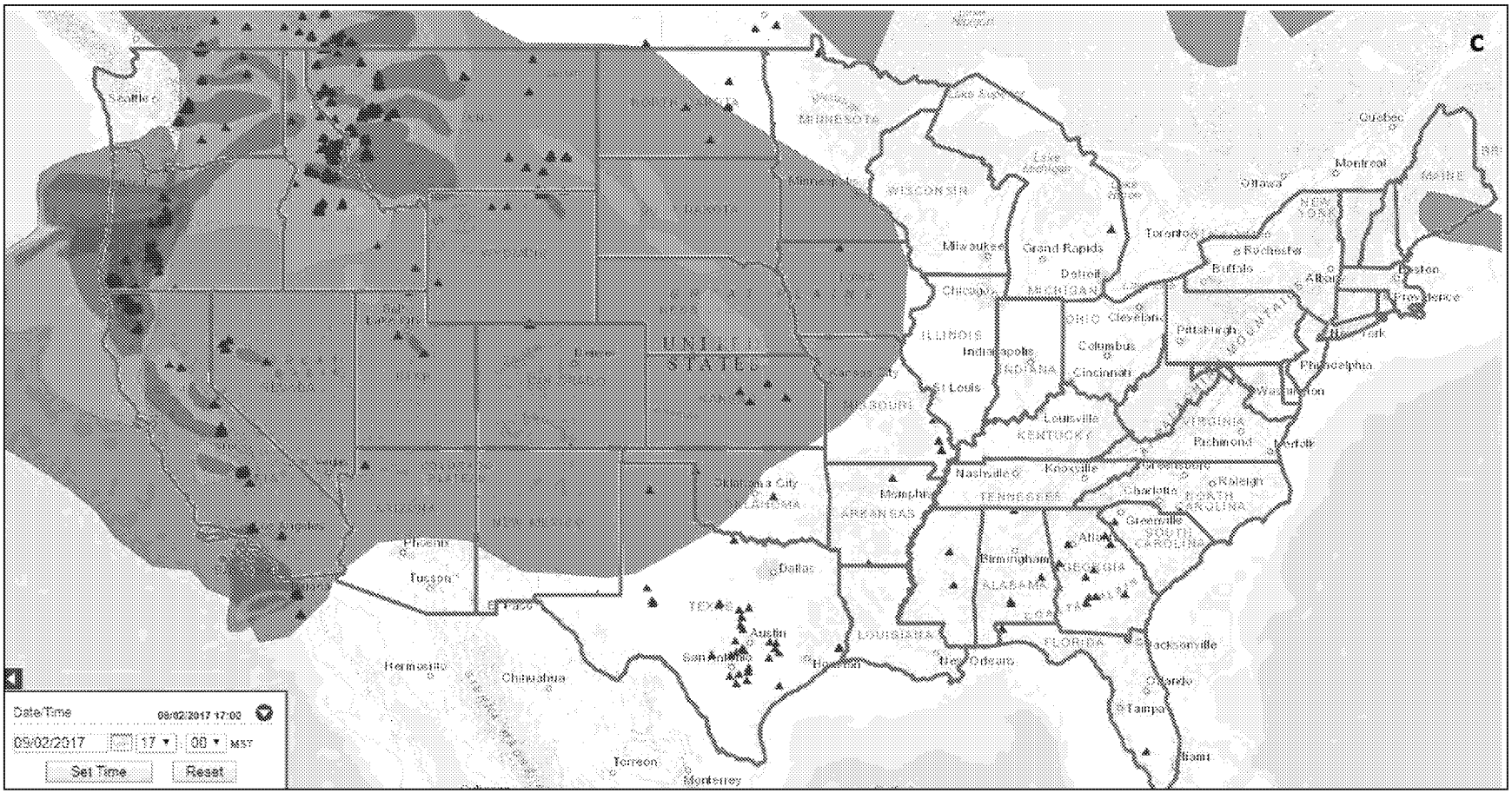


Figure 16c: HMS Fire and Smoke detection at 5:00 PM MST on September 2, 2017. (source: https://airnowtech.org/navigator)

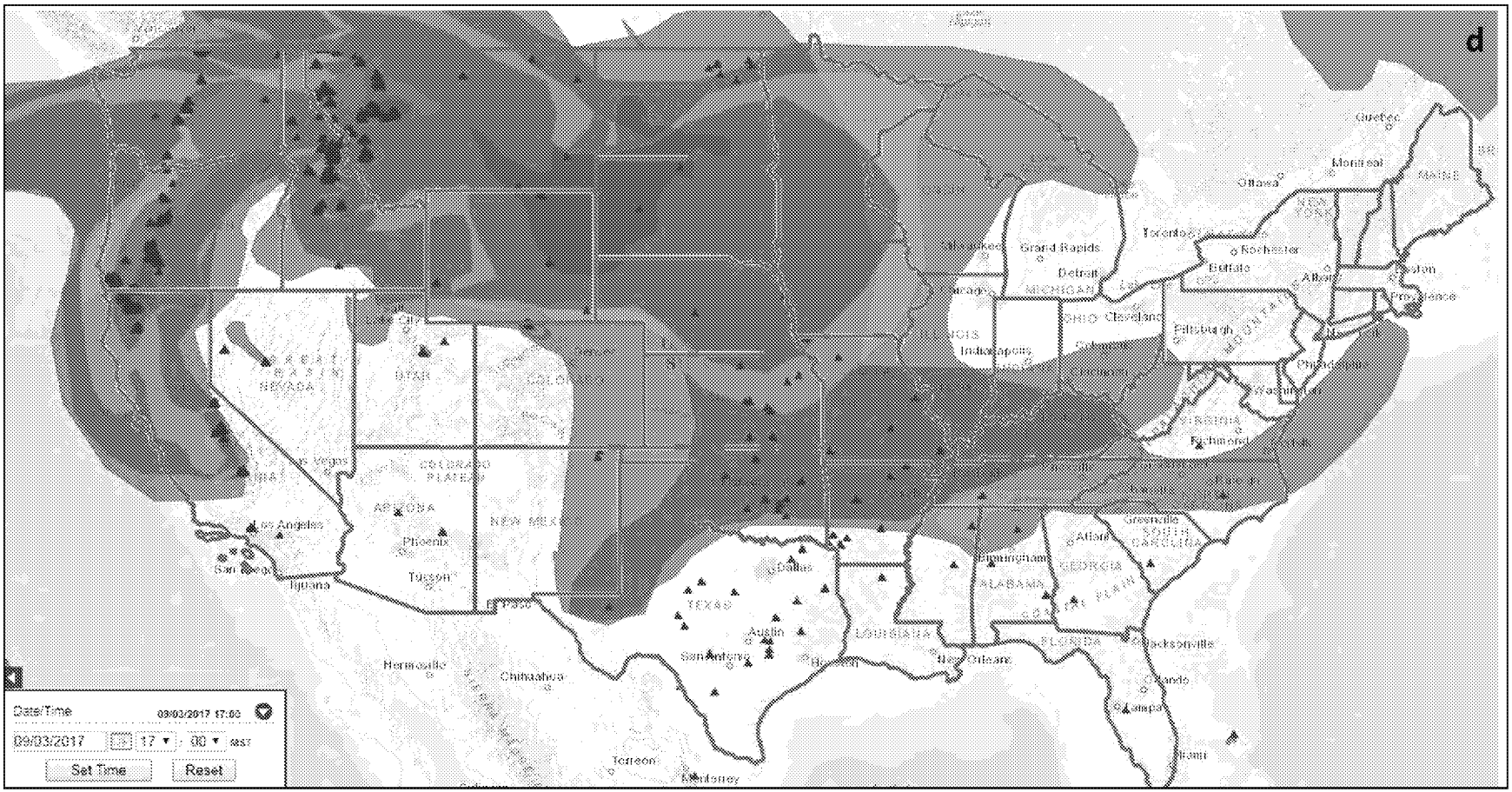


Figure 16d: HMS Fire and Smoke detection at 5:00 PM MST on September 3, 2017. (source: https://airnowtech.org/navigator)

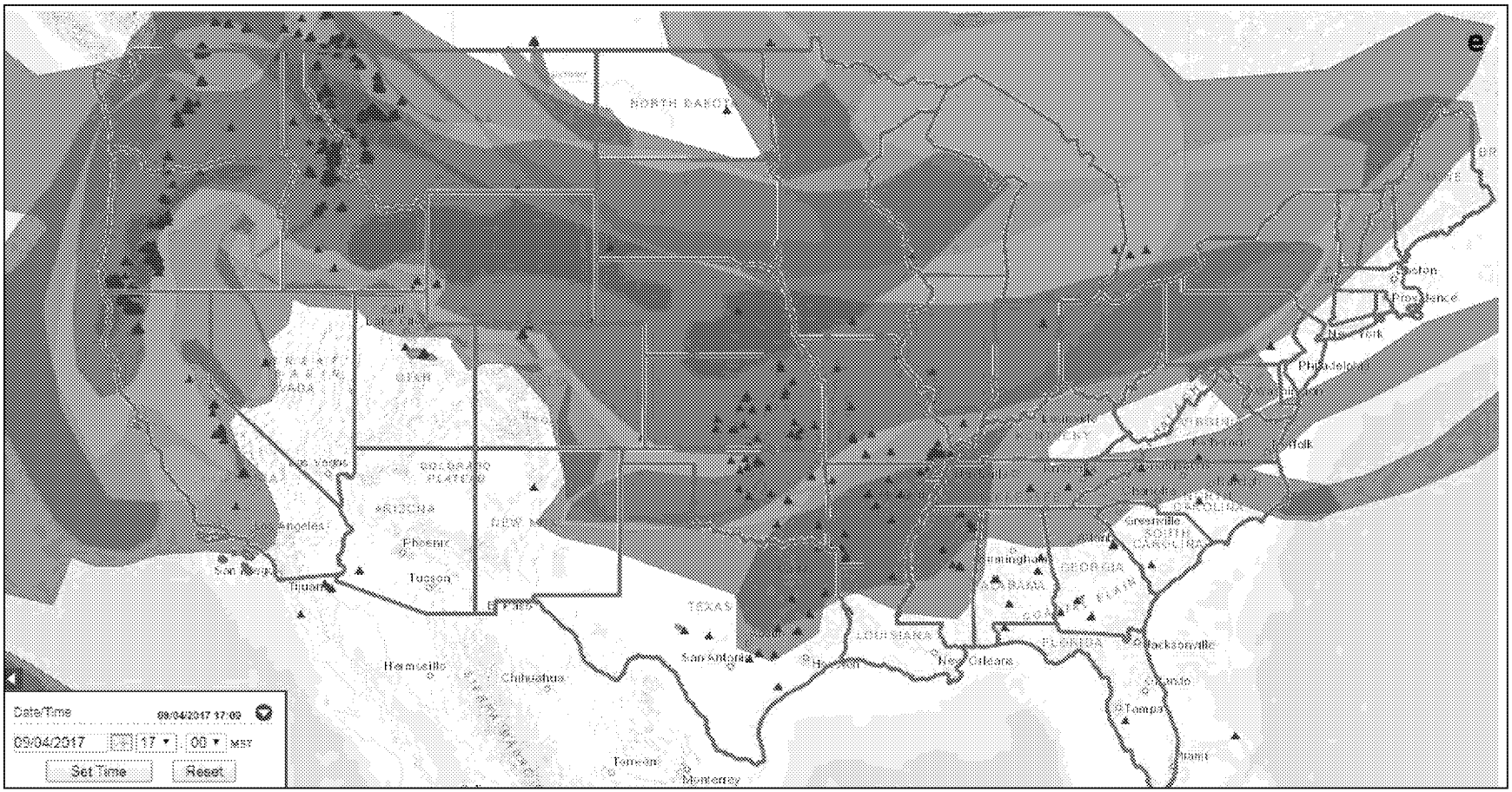


Figure 16e: HMS Fire and Smoke detection at 5:00 PM MST on September 4, 2017. (source: https://airnowtech.org/navigator)

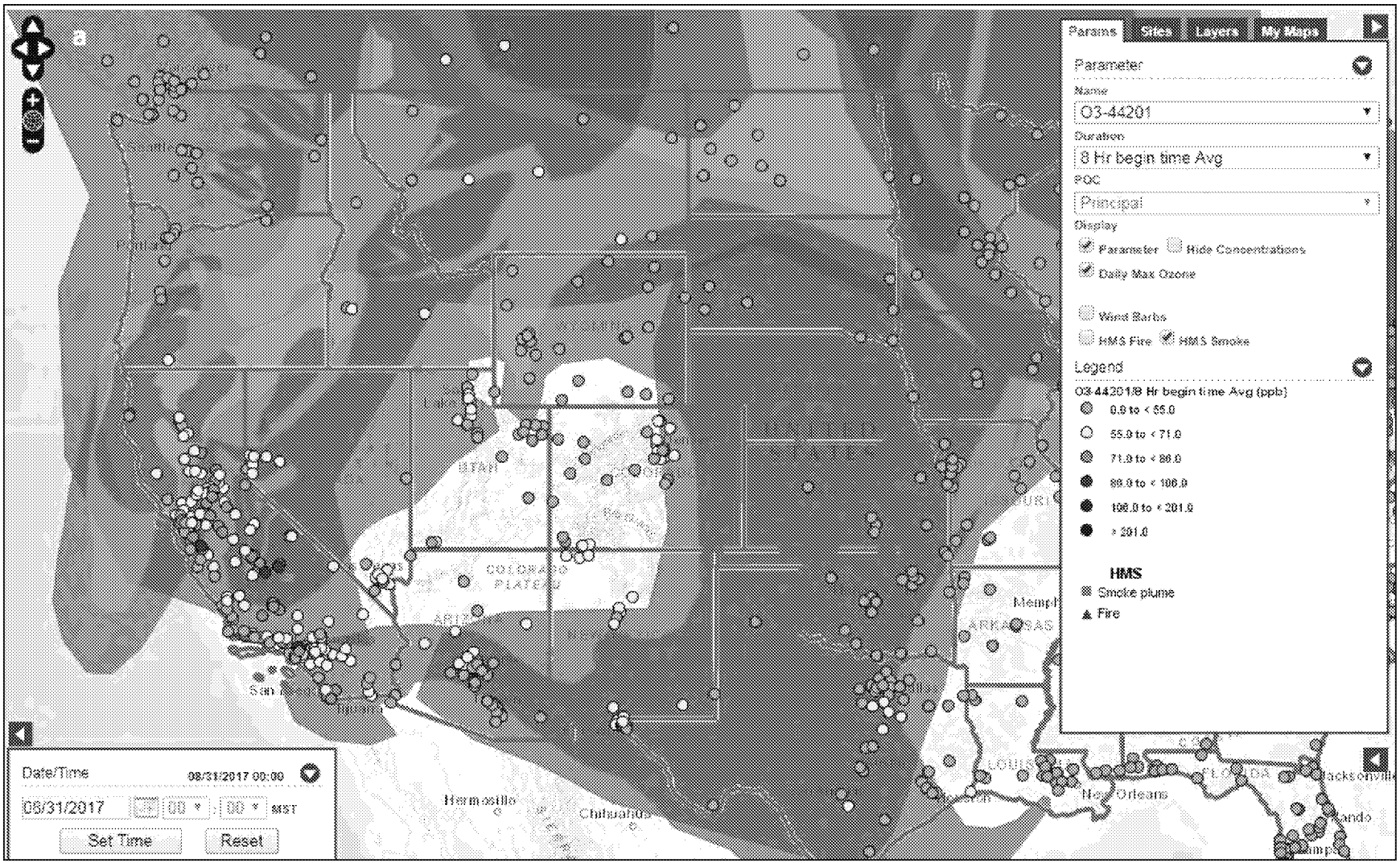


Figure 17a: HMS Smoke detection and 8-hr O_3 maximum concentration on August 31, 2017. (source: https://airnowtech.org/navigator)

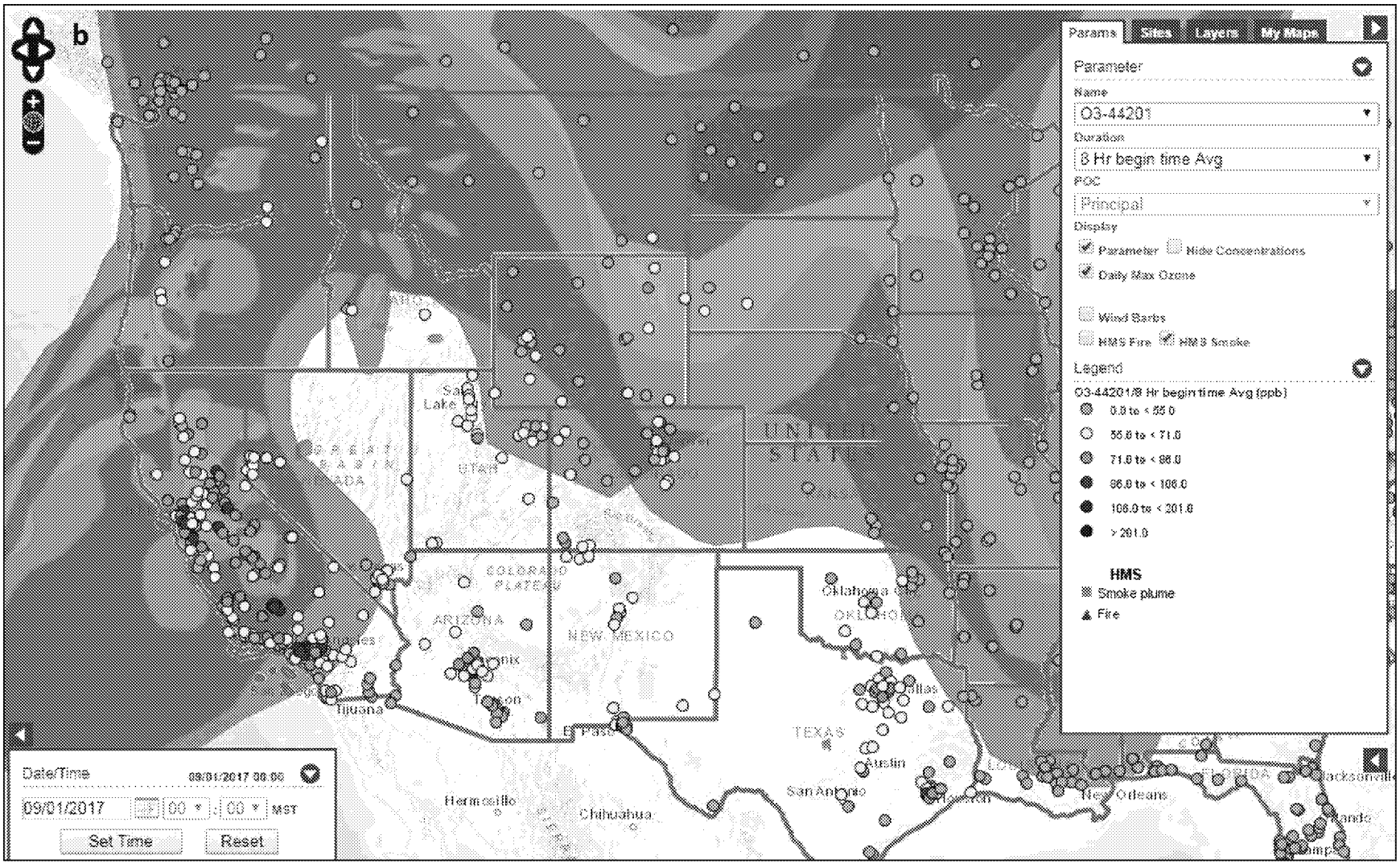


Figure 17b: HMS Smoke detection and 8-hr O_3 maximum concentration on September 1, 2017. (source: https://airnowtech.org/navigator)

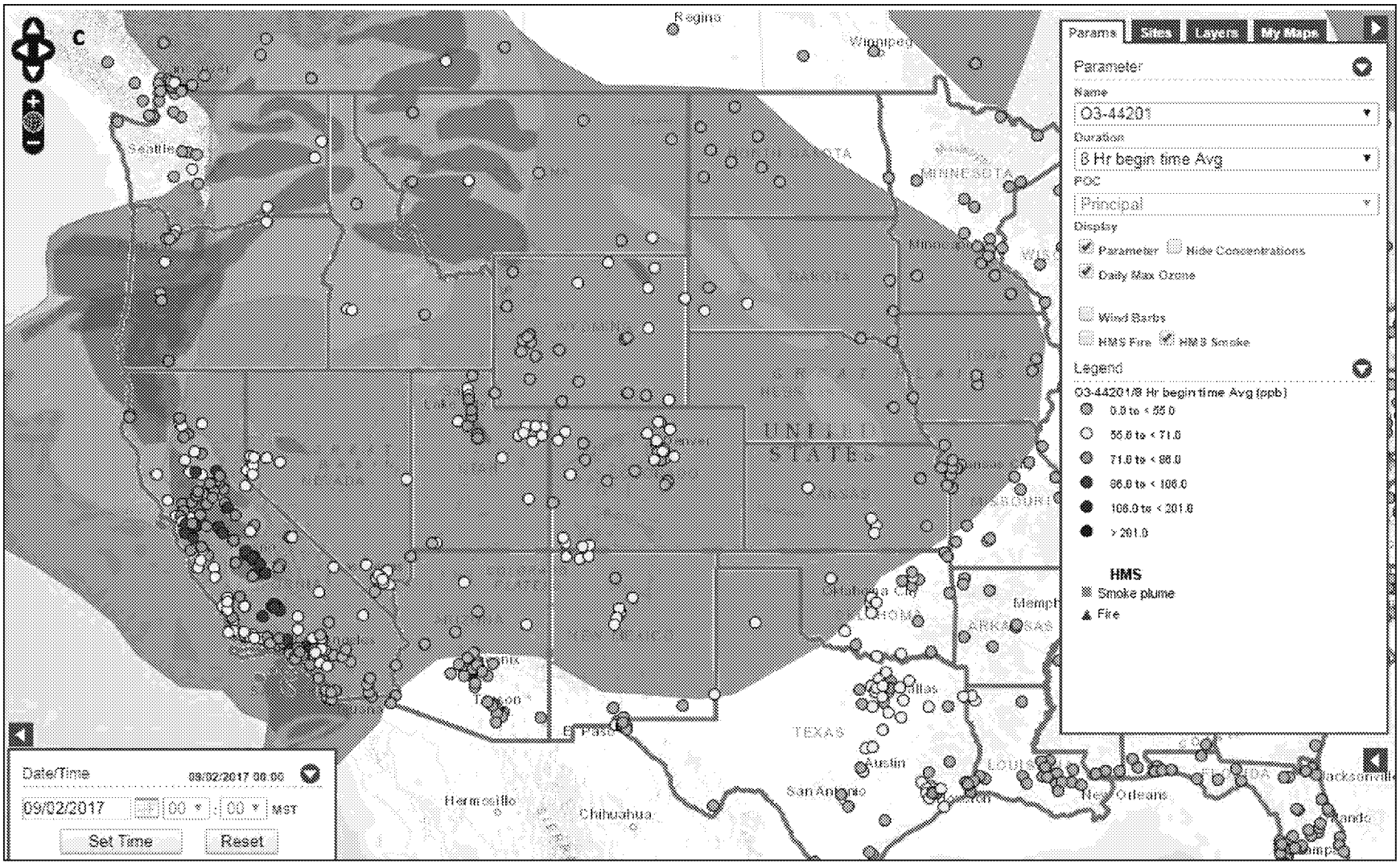


Figure 17c: HMS Smoke detection and 8-hr O_3 maximum concentration on September 2, 2017. (source: https://airnowtech.org/navigator)

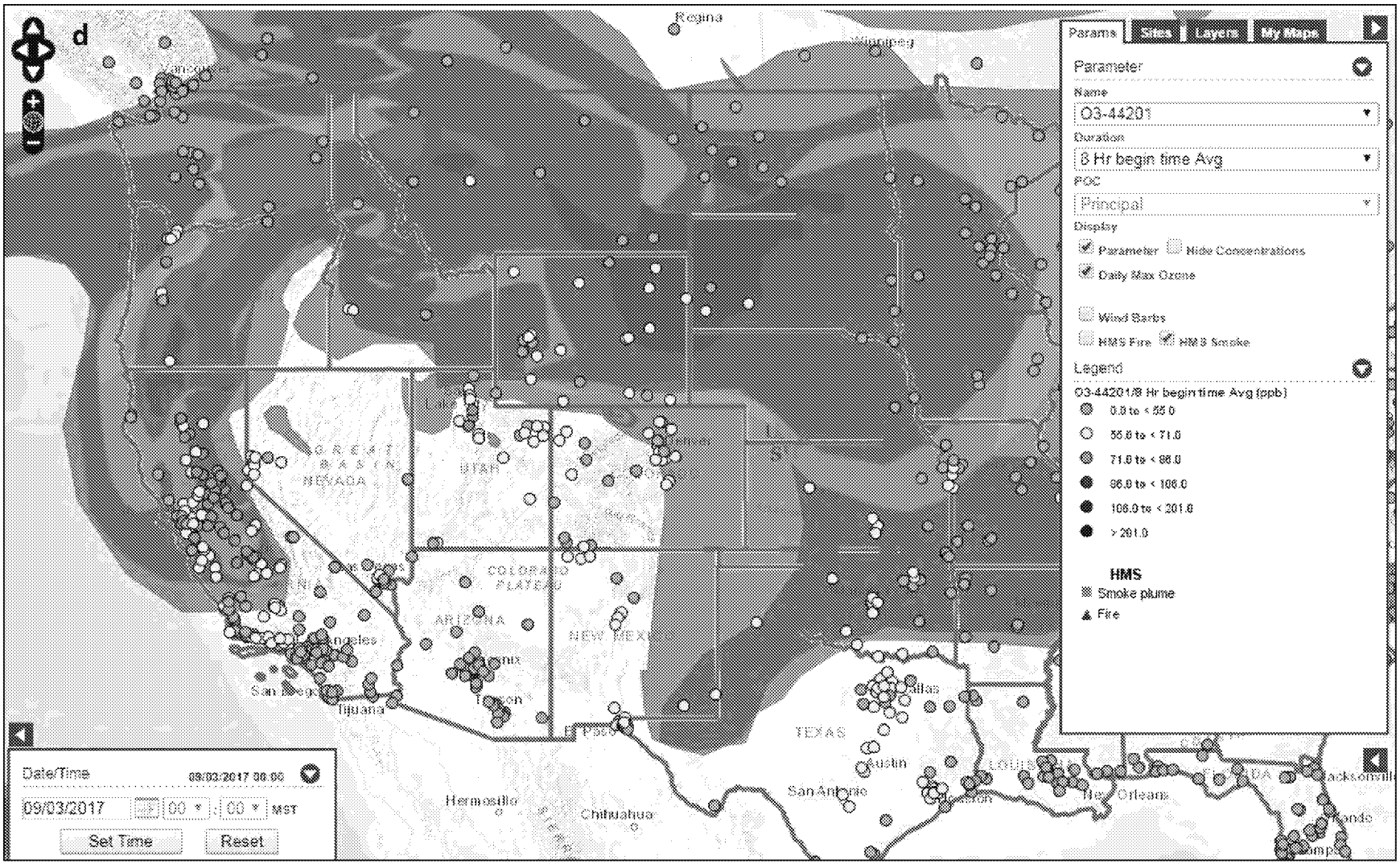


Figure 17d: HMS Smoke detection and 8-hr O_3 maximum concentration on September 3, 2017. (source: https://airnowtech.org/navigator)

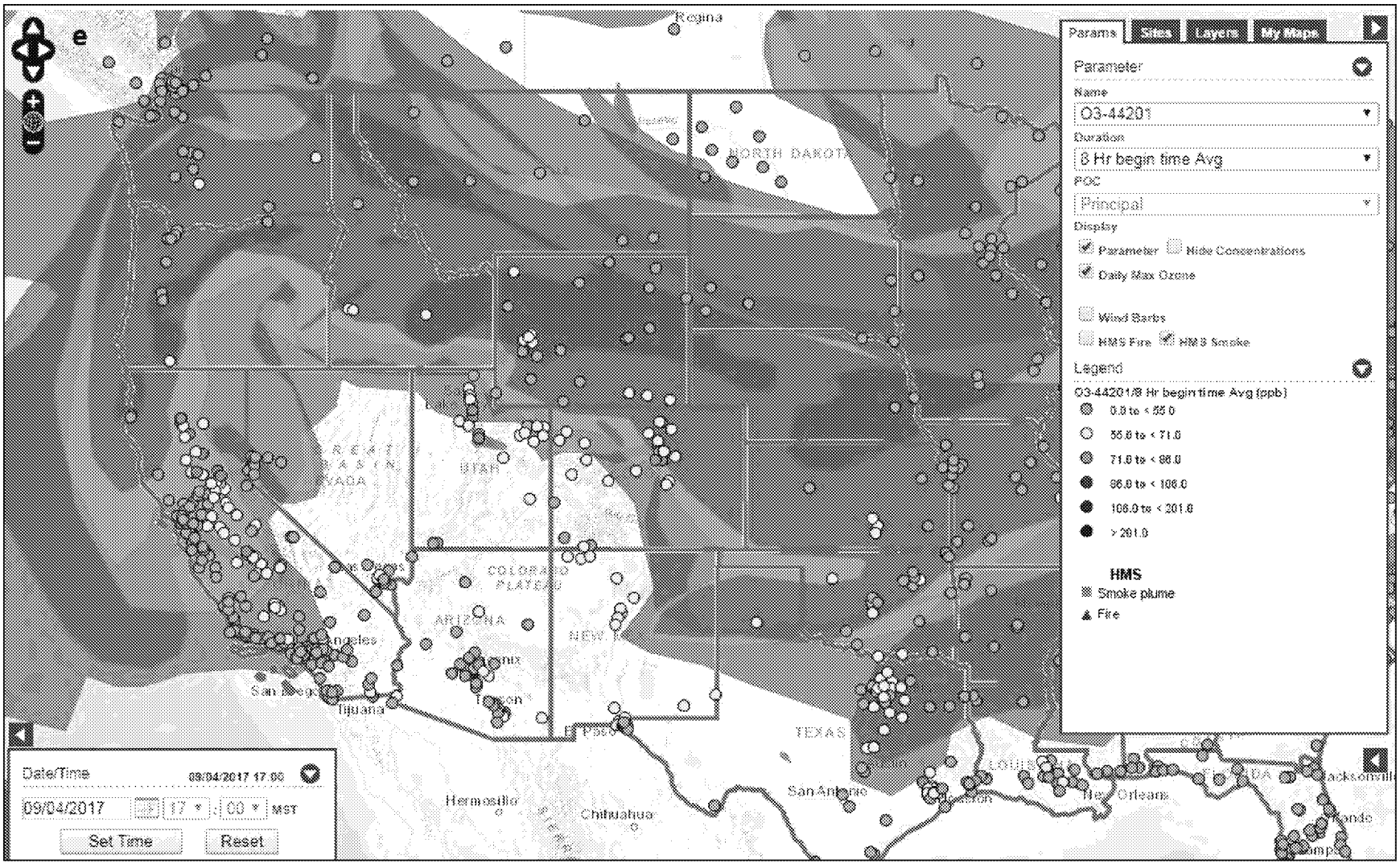


Figure 17e: HMS Smoke detection and 8-hr O_3 maximum concentration on September 4, 2017. (source: https://airnowtech.org/navigator)

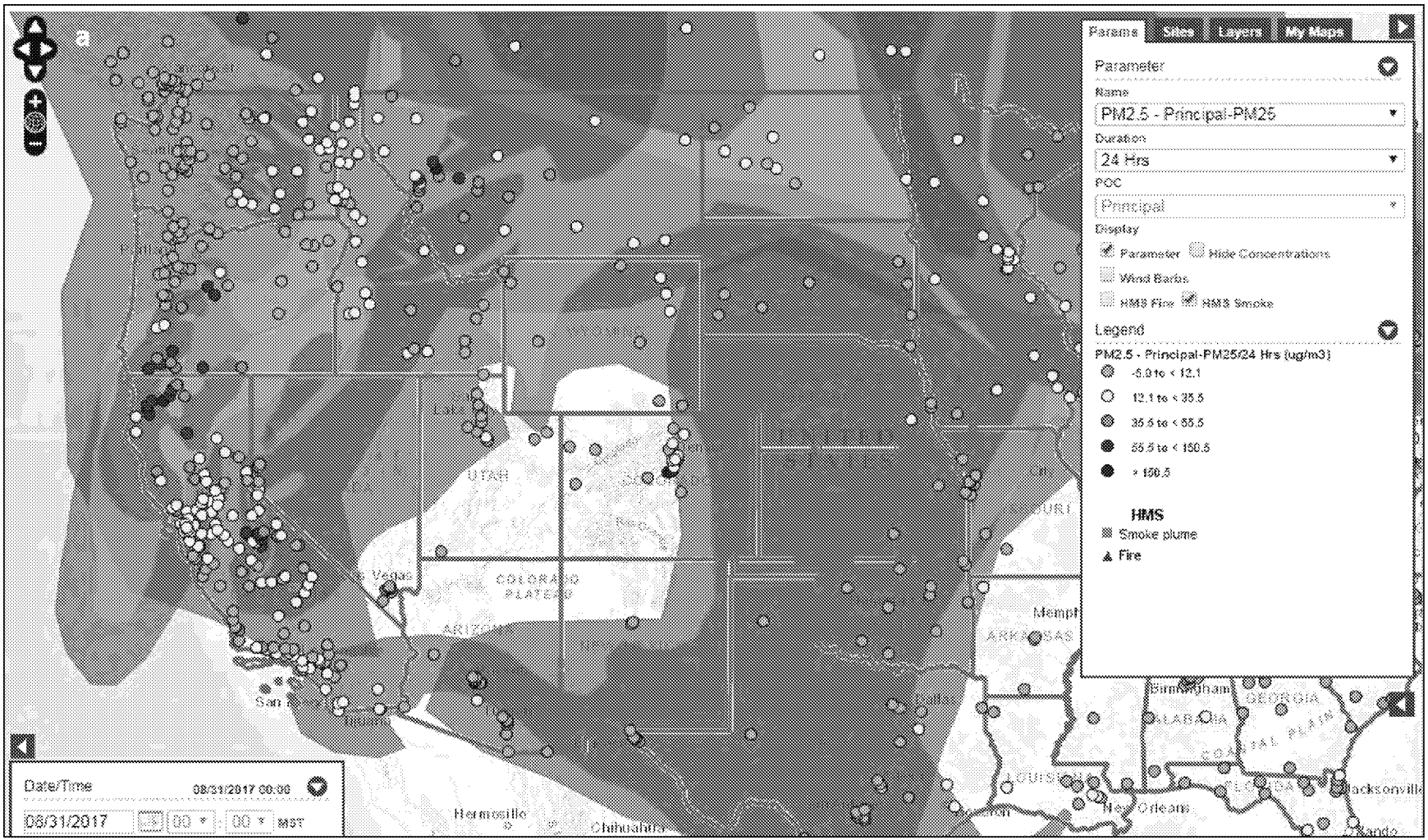


Figure 18a: HMS Smoke detection and 24-hr average $PM_{2.5}$ concentration on August 31, 2017. (source: https://airnowtech.org/navigator)

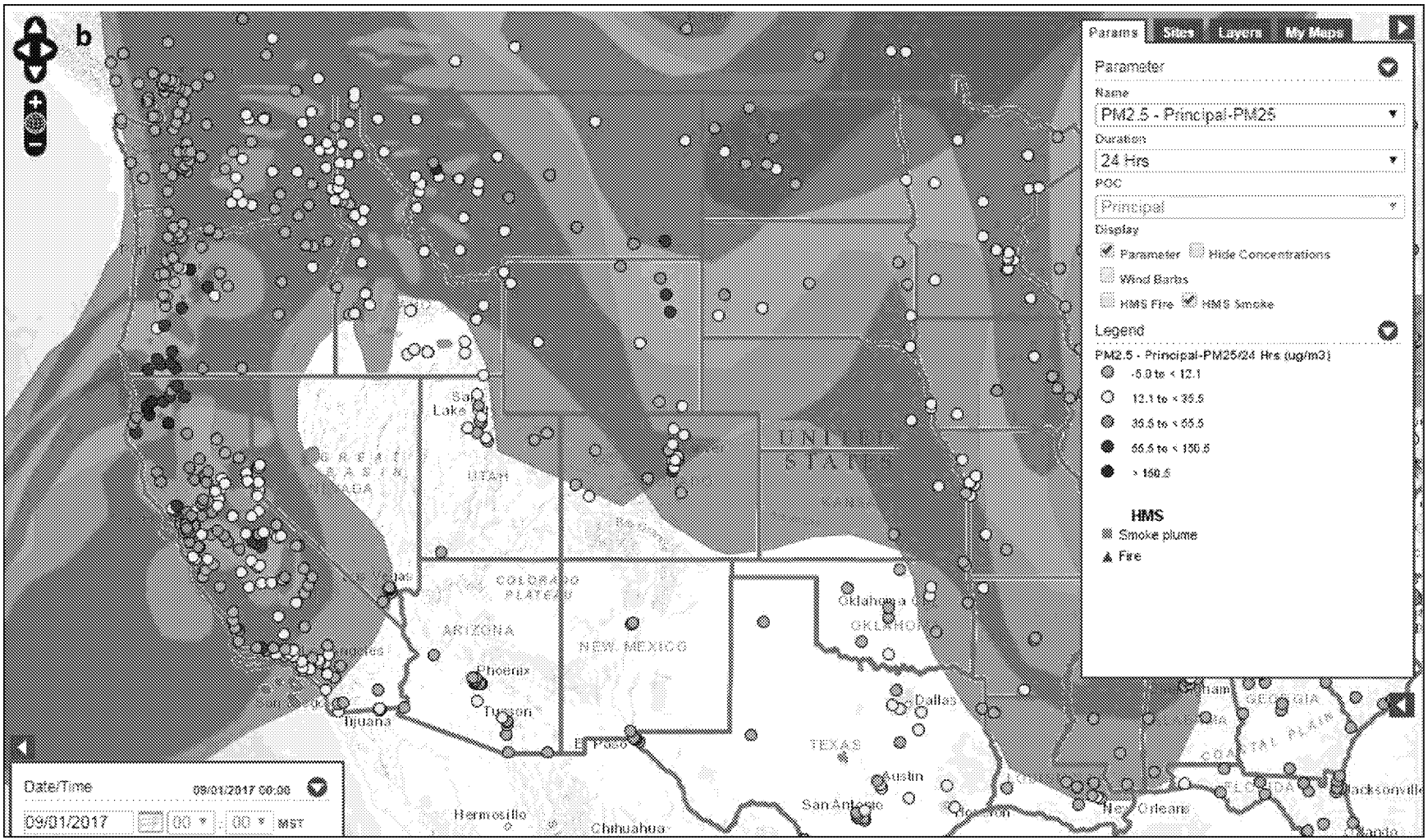


Figure 18b: HMS Smoke detection and 24-hr average $PM_{2.5}$ concentration on September 1, 2017. (source: https://airnowtech.org/navigator)

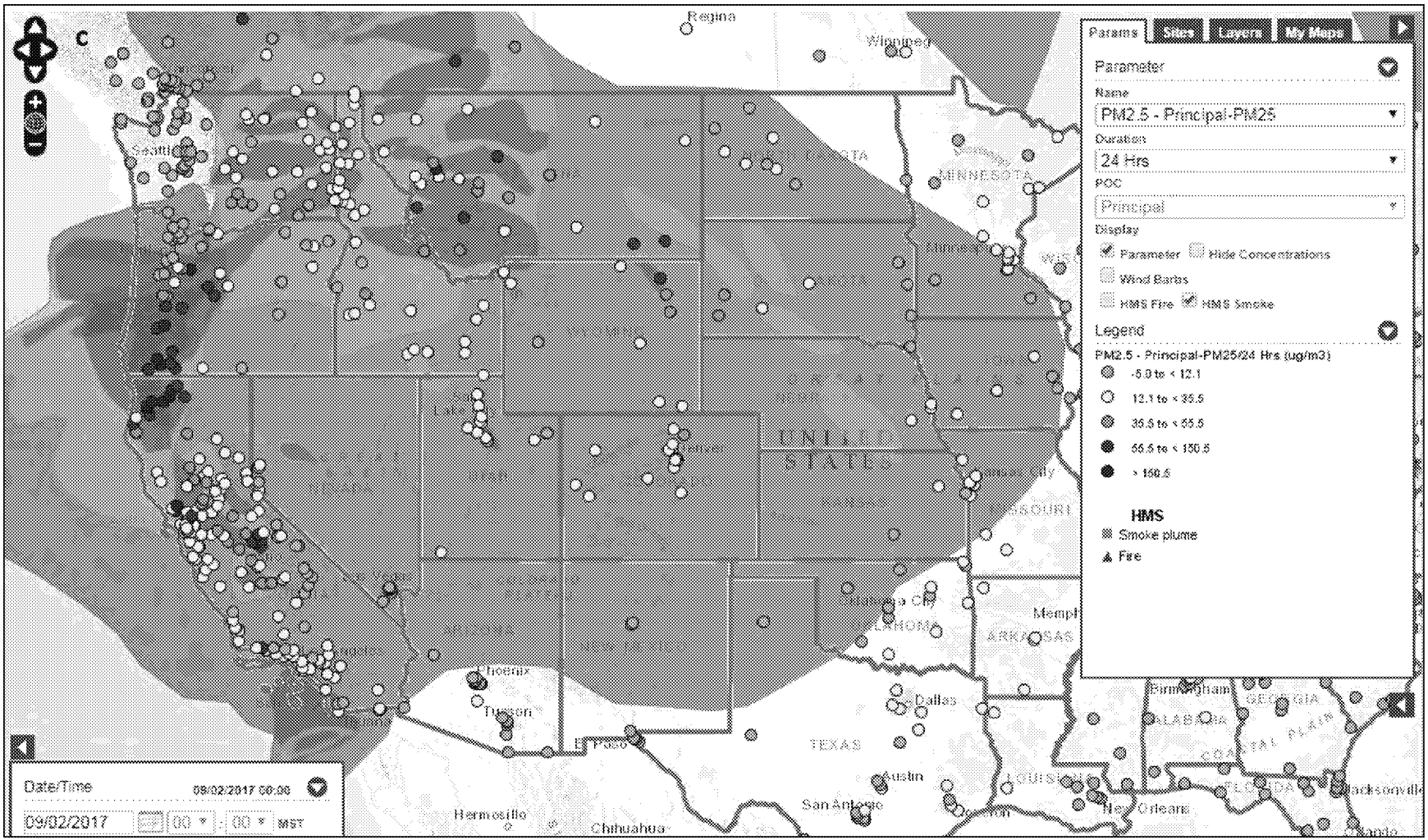


Figure 18c: HMS Smoke detection and 24-hr average $PM_{2.5}$ concentration on September 2, 2017. (source: https://airnowtech.org/navigator)

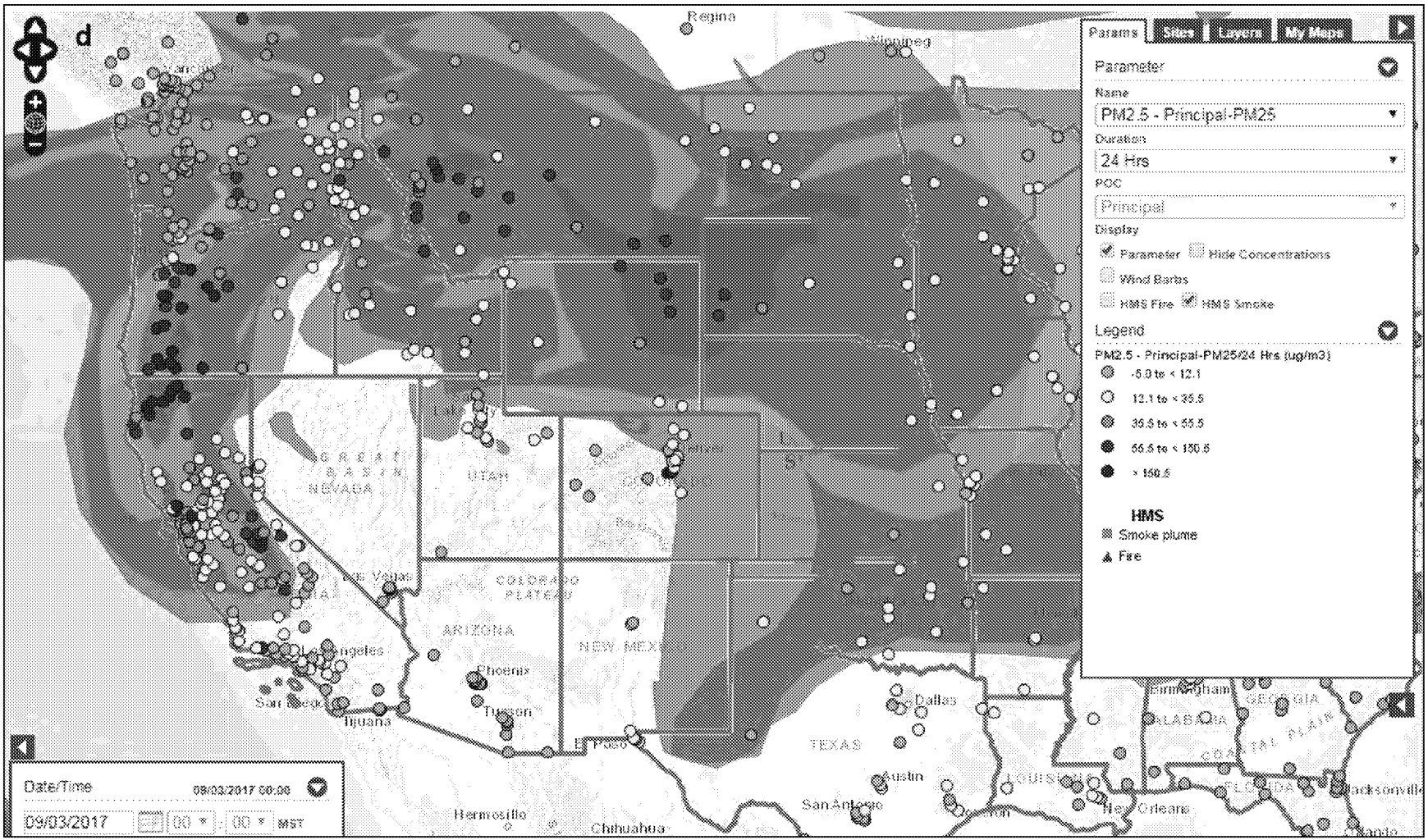


Figure 18d: HMS Smoke detection and 24-hr average $PM_{2.5}$ concentration on September 3, 2017. (source: https://airnowtech.org/navigator)

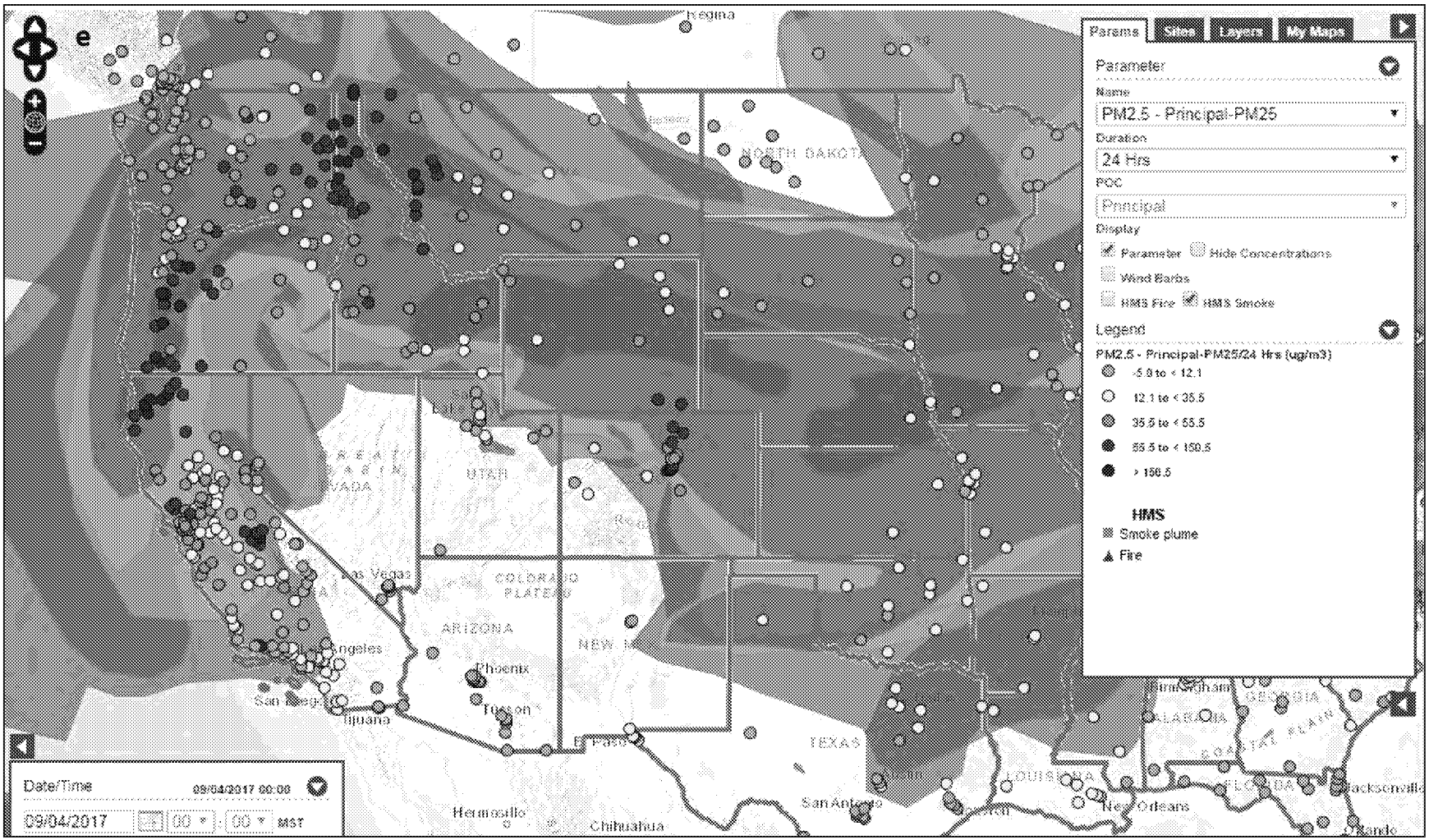


Figure 18e: HMS Smoke detection and 24-hr average $PM_{2.5}$ concentration on September 4, 2017. (source: https://airnowtech.org/navigator)

The extent and impact of the widespread wildfires and smoke throughout the country during this time period was published in a Wildfire Today article, by Bill Gabbert on September 17, 2017 (http://wildfiretoday.com/2017/09/17/looking-back-at-nifcs-june-prediction-for-august-september-wildfire-activity/). An excerpt from this article is below. Additional media coverage and social media posts are detailed in the Appendix A.

"Nationally, according to [National Interagency Fire Center] NIFC, 8.4 million acres have burned so far this year, which is 47 percent higher than the 10-year average to this date. Montana, which accounts for 1.2 million of those blackened acres, has been a focal point for seemingly endless fires producing staggering quantities of smoke. Combined with the smoke created by other fires in Idaho, Oregon, Washington, and northern California, the fouled air has affected residents across large sections of the country … A spokesperson for Montana's Department of Natural Resources and Conservation, Angela Wells, said 'the period from June to August was the hottest and driest on record in Montana, and our fire season started about a month earlier than it usually does.'"

Figure 19 is a social media post from the U.S. National Weather Service (NWS) Grand Junction office on September 2, 2017, "Wondering where all the smoke and haze is coming from? Well this smoke is originating from wildfires mainly in Montana and to some extent Idaho that is being transported southward around a large area of high pressure to our west …"

At 2:57 AM MDT on September 2, 2017, the Denver/Boulder NWS Office area forecast discussion warned the area of reduced visibility and smoke; "… smoke from wildfires in Montana is expected to increase over eastern Colorado today and may reduce visibility to 5 to 10 miles." Smoke was confirmed during the 1:08 PM MDT Aviation forecast; "Hazy/smoky conditions remain over the region under light northerly flow aloft." Additionally, warnings of smoke in the region were issued in the forecast discussion of September 4, 2017 at 3:19 AM MDT, stating, "Smoke from wildfires will be thicker today and may slow heating. […] It will be a smoky day across the area due to the wildfires over Montana and the Pacific Northwest. Visibility is ranging from 3 to 6 miles across southeast Wyoming, western Nebraska, and over northeast Colorado. Expect this reduced visibility to persist through the morning and gradually improve through the afternoon." The forecast was continued in the 10:34 AM MDT discussion later than morning; "Main story today is the smoke. Large plum evident from GOES-16 imagery stretching from the Pacific NW across the Central Plains. The southern extent is

now across most of the forecast area, and will be spreading into Park County later today. Air quality is poor to say the least." The detailed NWS forecast discussion from each day along with Descriptive Text Narrative products from the National Environmental Satellite, Data, and Information Service can be found in Appendix B.

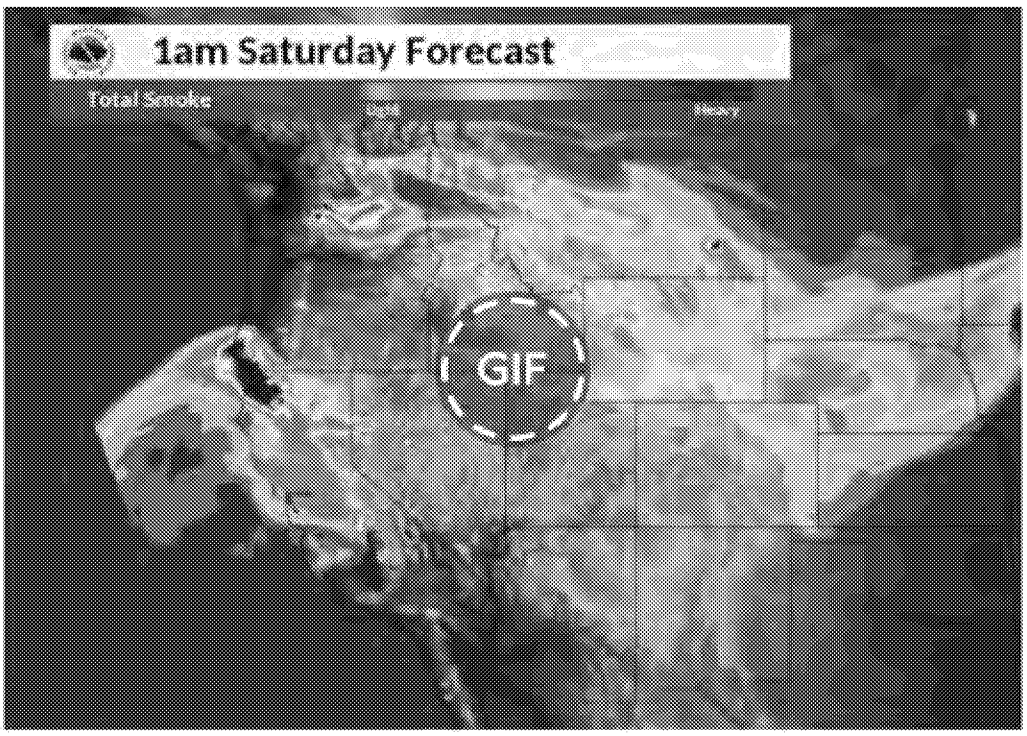
Detailed study of the relationship between wildfire smoke and elevated O_3 has been documented in several scientific peer-reviewed journal articles, including examples of O_3 enhancement from both nearby wildfires as well as far from the fire location due to the buildup and transport of O_3 precursors within the smoke plume. Additionally, EPA's Guidance highlights O_3-enhancing mechanisms and observations. Given that body of work as well as evidence of wildfire smoke O_3 enhancement noted in multiple exceptional event demonstrations already submitted to the EPA under this guidance, a detailed summary of how wildfire smoke leads to O_3 formation from a mechanistic standpoint is not necessary within the context of this demonstration. For details on previous research, see the State of Kansas Exceptional Event Demonstration Package April 6, 12, 13, and 29, 2011 (Kansas Department of Health and Environment, 2012) and the Sacramento Metropolitan Air Quality Management District demonstration requesting exclusions of 1-hr O_3 NAAQS exceedances due to wildfire smoke (California Air Resources Board, 2011). Other examples include multi-state demonstrations for O_3 exceedances due to smoke from the 2016 Fort McMurray wildfire (Connecticut Department of Energy and Environmental Protection, 2017; Massachusetts Department of Environmental Protection, 2017; New Jersey Department of Environmental Protection, 2017; Rhode Island Department of Environmental Management, 2017). Here, APCD details the clear causal relationship between wildfire smoke transport into the DM/NFR area and O_3 NAAQS exceedances, within the historical context of non-event O_3 in the DM/NFR area.

US National Weather Service Grand Junction Colorado

Like Page

September 2

Wondering where all the smoke and haze is coming from? Well this smoke is originating from wildfires mainly in Montana and to some extent Idaho that is being transported southward around a large area of high pressure to our west. Here is an animation of the latest experimental HRRR model run showing smoke transport and dispersal throughout the atmosphere through Sunday morning. The pattern overall does not change much over the next few days, so expect at least hazy skies until a disturbance hopefully moves through and helps clear out the smoke in the air. The latest forecast models indicate this potentially happening Monday afternoon and evening, but still low confidence on that as high pressure builds back in for the remainder of next week.



47 3 Comments 80 Shares 125 Views

Like Comment Share

Figure 19: Grand Junction NWS office social media post on wildfire smoke in the region on September 2, 2017. (source: https://www.facebook.com/NWSGrandJunction/)

4.0 Clear Causal Relationship

4.1 Introduction

This section of the Exceptional Event demonstration details a technical analysis of the clear causal relationship between a widespread wildfire episode during the week of August 31–September 4, 2017 and the monitored exceedances, providing evidence that the episode adversely affected air quality. As specified in the Guidance, demonstrations should support the clear causal relationship. This includes: 1) evidence that the fire's emissions were transported to the monitor(s), 2) evidence that emissions from the wildfire influenced the monitored concentrations, and 3) quantification of the wildfire's emissions contributing to the monitored O_3 exceedance, and 4) a comparison of O_3 data requested for exclusion against historical O_3 concentrations at the affected monitor(s).

The Guidance defines a tier-based approach for demonstrations established by the episode's influence on O_3 and the level of evidence required to demonstrate a clear causal relationship between the episode and the exceedance. A Tier 2 approach is most appropriate for this wildfire smoke episode as described. Sections 4.2.1 and 4.2.2 detail Key Factor 1 and evidence of the presence of smoke. Section 4.3 details a historical analysis of this exceptional event in the context of six years of O_3 observations. This demonstration meets the requirements laid out in the Guidance and provides the evidence needed for EPA Region 8 to concur that an exceptional event episode occurred on September 2 and September 4, 2017.

4.2 Event Analysis

For each exceedance event day (September 2 and 4, 2017), this section will review meteorological conditions on the day, including forward and backward trajectories, identify wildfires whose smoke emissions are within the source region of the trajectories, provide additional evidence of the presence of smoke within the DM/NFR area, and include an analysis of wildfire smoke emissions with respect to distance from the fire location. Additionally, in Section 4.3, a historical analysis is provided, comparing the event days to historical O_3 and $PM_{2.5}$ data from within the DM/NFR area.

ED_002666_00009483-00067

4.2.1 September 2, 2017 Exceedance

On September 2, 2017, seven O_3 monitors experienced high O_3 levels (at or above 0.068 ppm maximum daily 8-hour averaged concentration), with four of those monitors above the 0.070 ppm 2015 NAAQS, and one greater than the 0.075 ppm 2008 NAAQS. The NREL monitor was the highest in the region at 0.076 ppm, or 76 ppb as seen in Figure 20.

To show the path and source of air that arrived at the monitor during the morning of the exceedance, back trajectories using the HYSPLIT analysis were run from NREL's location (for more information on HYSPLIT: https://ready.arl.noaa.gov/HYSPLIT.php). All back trajectories in this demonstration will use NREL's location, as the monitor exceeded the 2008 O_3 NAAQS both days and it serves as a proxy for the DM/NFR airshed. Figure 21, initialized with both High-Resolution Rapid Refresh (HRRR) and Global Data Assimilation System (GDAS, which uses Global Forecast System, GFS) weather models, presents back trajectories from NREL at 500, 2000, and 3500 m above ground level (AGL), starting at 11 AM MST (18Z) on September 1, 2017 and ending 7 AM MST (12Z) September 2, 2017. These height levels are representative of the surface/low-level and mid-level flow in the atmosphere up to the steering winds at the top of the planetary boundary layer (PBL) during this time period. It should be noted that the lowest level was modelled at 500 m AGL as opposed to a level closer to the earth's surface. This process avoids any topographical or frictional layer bias that could negatively affect the model output.

Four wildfires were active in the northeastern Wyoming and southeastern Montana source region in the days preceding September 2, 2017: Cottonwood One, Tidwell, Brush Flat, and Sartin Draw (detailed reports on each fire can be found in Appendix C). Back trajectories at 3500 m AGL, as shown in Figure 21, indicate a source region in the vicinity of the four wildfires. To verify smoke transport from this area, forward HYSPLIT trajectories were analyzed as a matrix at these four fires, starting 5:00 PM MST August 31, 2017 (0z, 9/1/17) through 2:00 AM MST September 1, 2017 (9Z, 9/1/17), as seen in Figure 22, and starting 5:00 PM MST September 1, 2017 (0Z, 9/2/17) through 2:00 AM MST September 2, 2017 (9Z, 9/2/17), as seen in Figure 23. A height of 2500 m AGL was used for both forward trajectories as this level is located just below the PBL, at the region of the fires, on both August 31 and September 1, 2017, as illustrated in Figures 24a-b. The PBL height acts a cap on the mixed layer in the troposphere; any smoke emitted below this level will mix up to that height and

winds at that height will act as a steering force, transporting the smoke downwind. Smoke emissions from these fires on both August 31 and September 1, 2017 influenced the DM/NFR area's airshed on September 2, 2017. The forward trajectory analysis starting on August 31 indicates smoke emissions would enter northeastern Colorado overnight into September 2, 2017. The forward trajectory analysis starting on September 1 indicates smoke emissions entered western Nebraska overnight into September 2, 2017.

Additional evidence of smoke transport from these fires is demonstrated in (MODIS) Aqua True Color Satellite Imagery with Hazard Mapping System (HMS) fire detection on August 31 in Figures 25a, but especially on September 1 in Figures 25b. Furthermore, elevated total column carbon monoxide (CO) is illustrated in Figure 26 with concentrations in excess of 100 ppb in northeastern Colorado and western Nebraska at 12:52 PM MST on September 2, 2017. Smoke emitted from these four fires with significant amounts of CO follows a path similar to the forward trajectories in Figure 22.

High Aerosol Optical Depth (AOD) is also observed across northeastern Colorado and western parts of Nebraska on the morning of September 2, 2017, as seen in Figure 27. For a closer look at AOD in Colorado, Figure 28 is the MODIS Terra AOD at 11 AM MST on September 2, 2017, with North American Model (NAM) analysis surface wind vectors. High AOD indicates an optically thick aerosol layer, in this case wildfire smoke. Figure 28 suggests that smoke in northeastern Colorado and western Nebraska was transported by northeasterly surface winds into the DM/NFR area.

Figure 29 shows that the smoke moved into an air mass with a shallow boundary layer of 1000-2000 meters ABL. Note, the lowest boundary layer heights can be found in areas near the Front Range and Palmer Divide foothills within the DM/NFR area where the highest O_3 concentrations were measured. Visual evidence of ground-level smoke is presented in the webcam image in Figure 30, from CDPHE's live image on 10:57 AM MST on September 2, 2017. For comparison, a smoke-free image from the same date two years prior is presented in Figure 31, taken at 10:57 AM MST on September 2, 2015.

APCD maintains an aethalometer at one of its near road sites, I-25 Denver (Figure 1) in central DM/NFR. An aethalometer is a continuous instrument that measures the concentration of optically absorbing black carbon particles in ambient air. The proximity of the site to the

major north-south Interstate in Denver suggests that in addition to the ambient background the sample will be strongly affected by vehicle emissions, especially particulates from diesel-powered vehicles. Figure 32 demonstrates a representative high ozone day, in this case from August 30, 2017, three to five days prior to the exceedance days. The units are in ng/m^3. The presence of smoke is indicated by the presence of 'separation' between absorption at shorter wavelengths (i.e. 370 nm) and absorption at longer wavelengths (Zhang K.M., et al., 2017). That indicative separation is not present in Figure 32. However, as presented in Figure 33, in the aethalometer data for September 2, 2017, there is separation between the shorter and longer wavelengths, indicating the presence of ground-level smoke within the DM/NFR area.

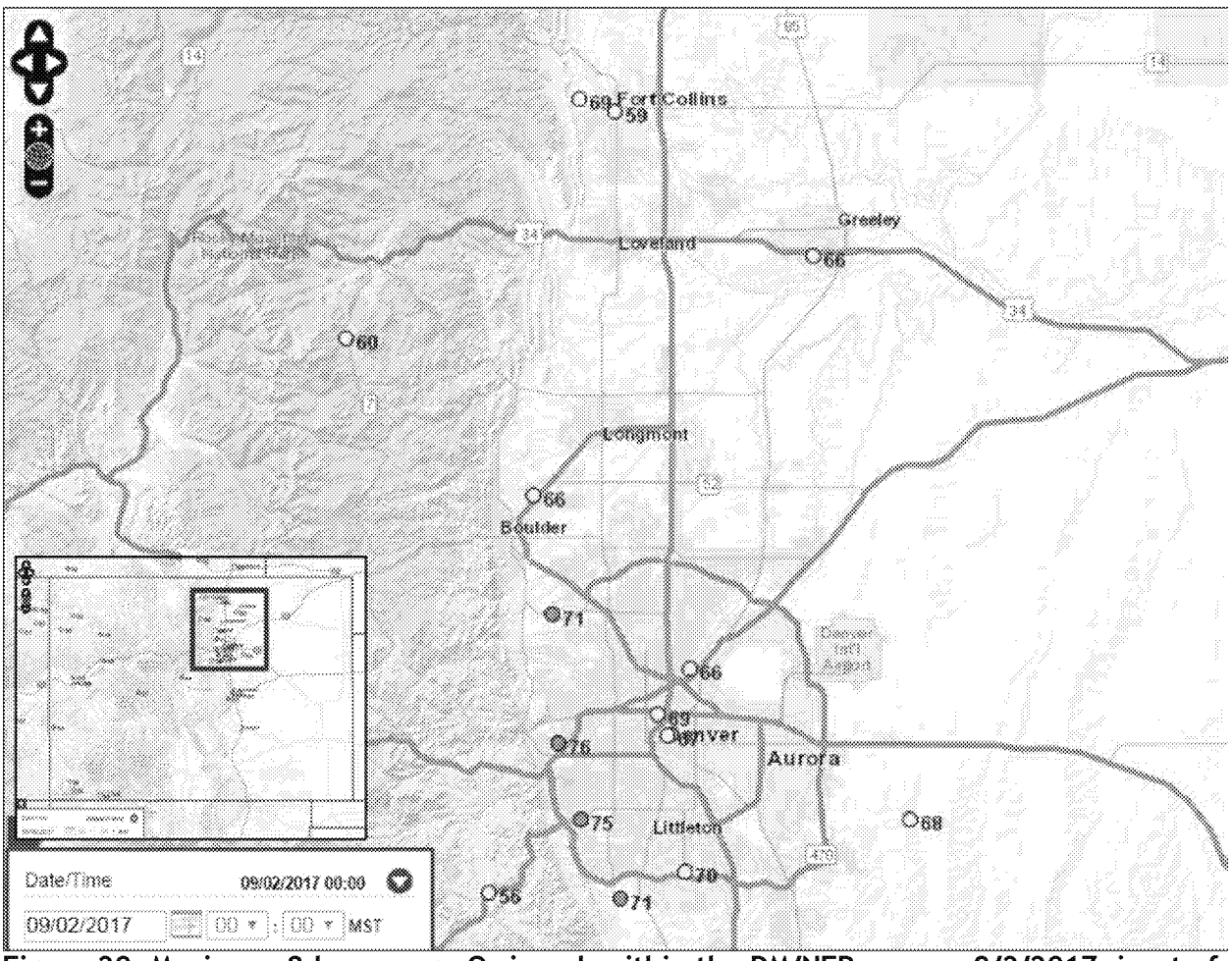


Figure 20: Maximum 8-hr average O_3 in ppb within the DM/NFR area on 9/2/2017, inset of the State of Colorado for geographical reference (source: https://airnowtech.org/navigator/)

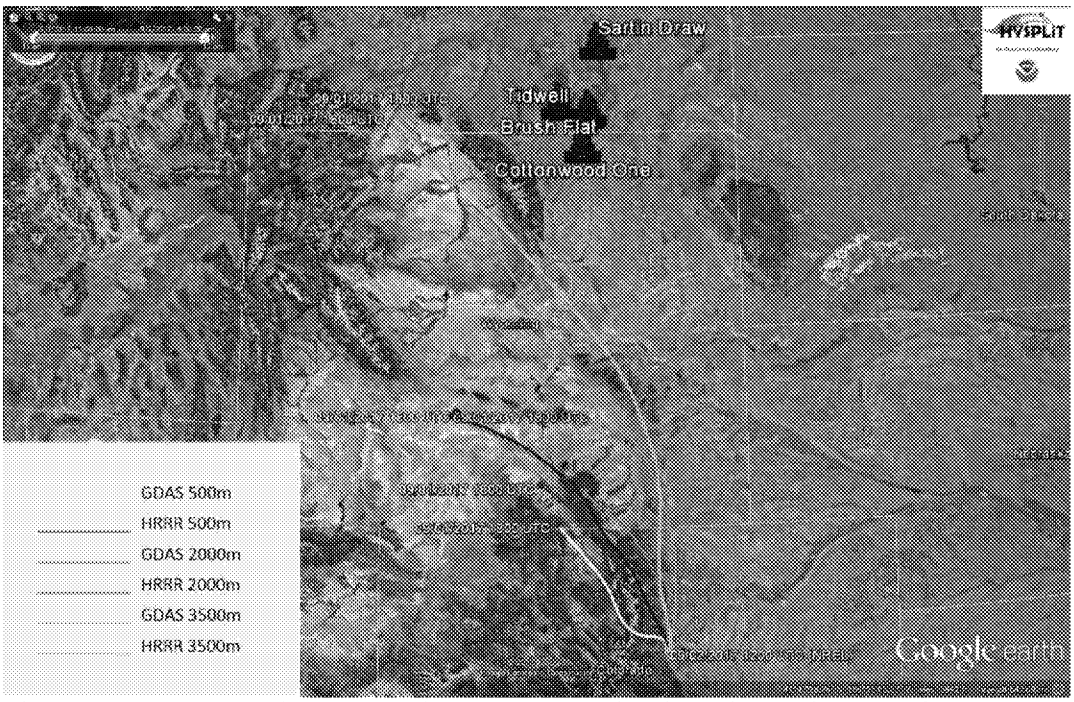


Figure 21: HRRR and GDAS 18-hour HYSPLIT back trajectories starting at 7 AM MST (12Z) September 2, 2017. (source: https://ready.arl.noaa.gov/HYSPLIT.php)

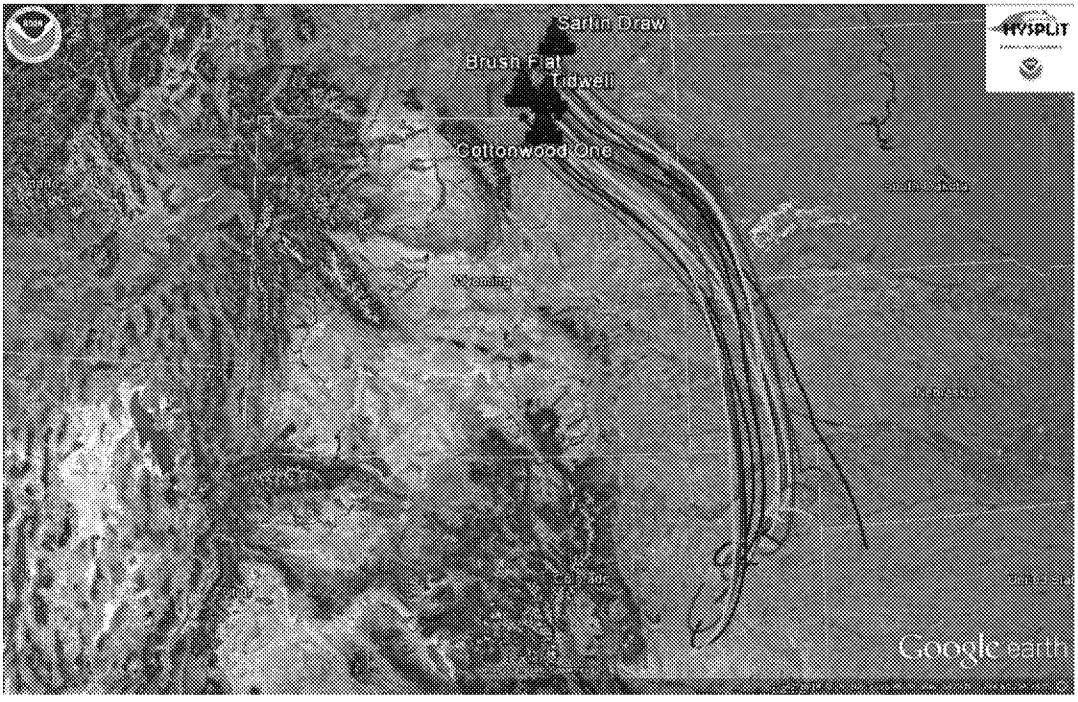
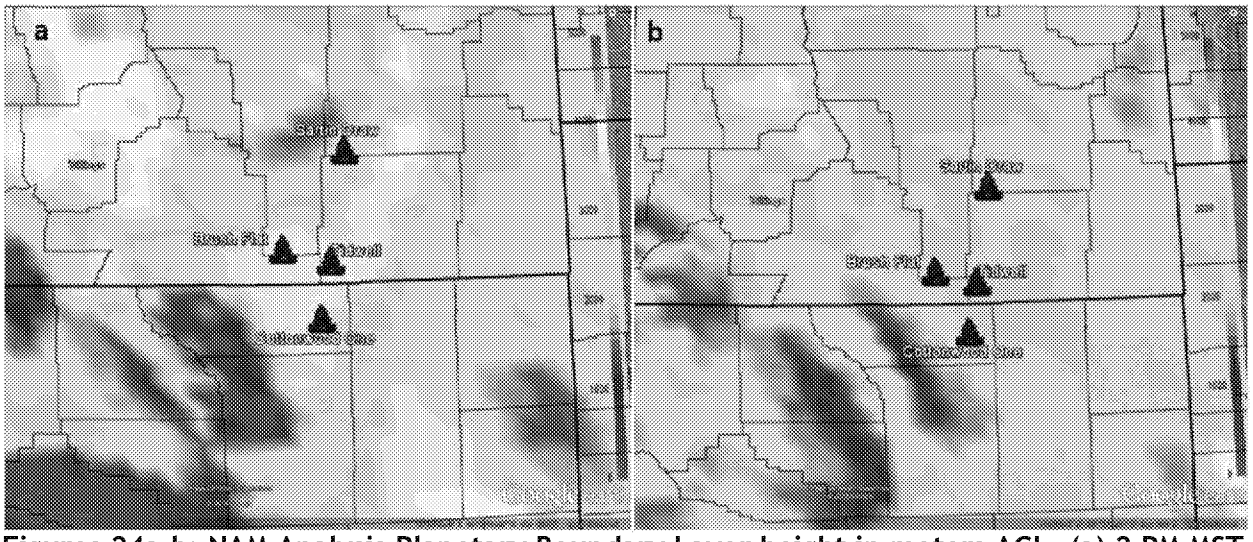
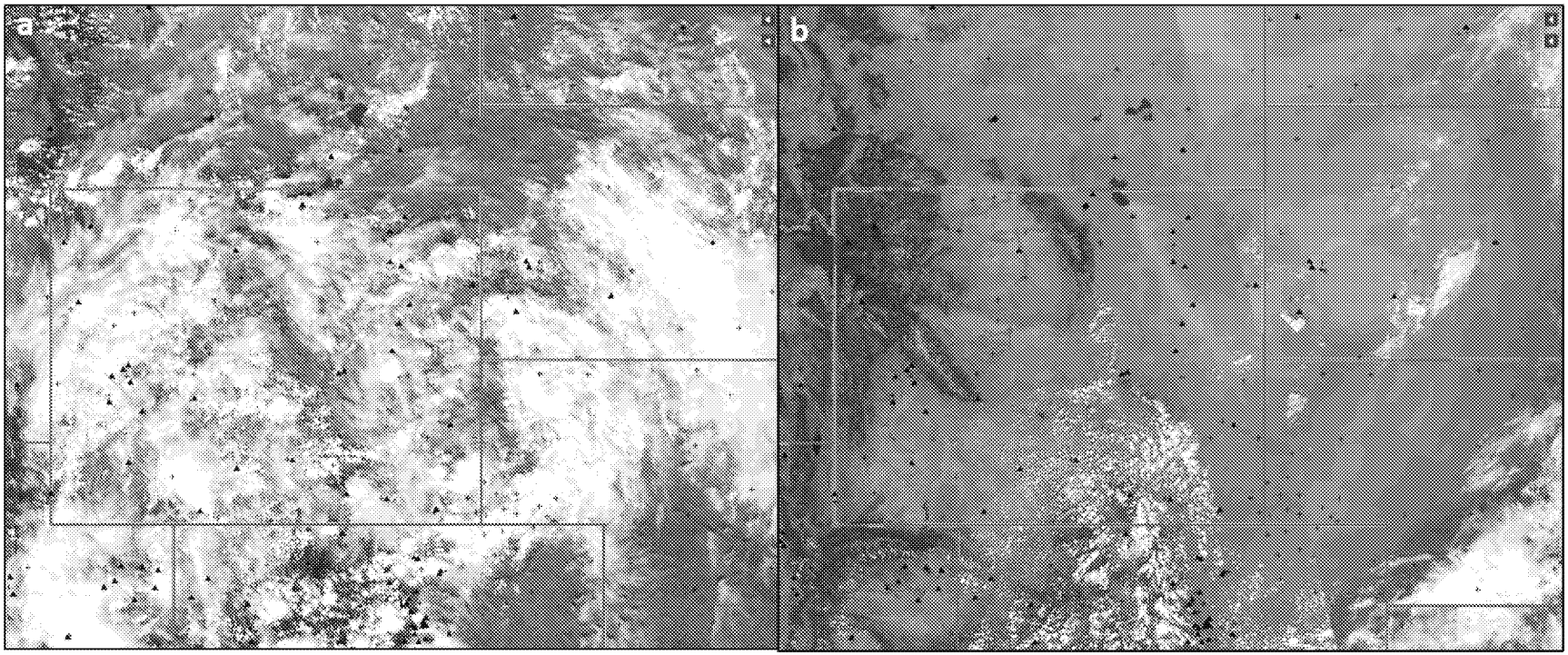


Figure 22: GDAS 33-hour HYSPLIT forward trajectory matrix from NE Wyoming/SE Montana wildfires at 2500 meters AGL, starting at 5 PM MST (0Z September 1, 2017) August 31, 2017 and ending at 2 AM MST (9Z) September 2, 2017.(source: https://ready.arl.noaa.gov/HYSPLIT.php)

Figure 23: GDAS 9-hour HYSPLIT forward trajectory matrix from NE Wyoming/SE Montana wildfires at 2500 meters AGL, starting at 5 PM MST (0Z September 2, 2017) September 1, 2017 and ending at 2 AM MST (9Z) September 2, 2017.
(source: https://ready.arl.noaa.gov/HYSPLIT.php)



Figures 24a-b: NAM Analysis Planetary Boundary Layer height in meters AGL, (a) 2 PM MST (21Z) August 31, 2017, and (b) 2 PM MST (21Z) September 1, 2017.
(source: https://nomads.ncdc.noaa.gov/thredds/catalog.html)



Figures 25a-b: MODIS Aqua image with Hazard Mapping System (HMS) detected hot spots, (a) August 31, 2017 at approximately 1:07 PM MST (1807Z),and (b) September 1, 2017 (combined image of two satellite passes with western half of the image at approximately 1:50 PM MST (2050Z) and the eastern half of the image at approximately 12:10 PM MST (1910Z). (source: https://airnowtech.org)

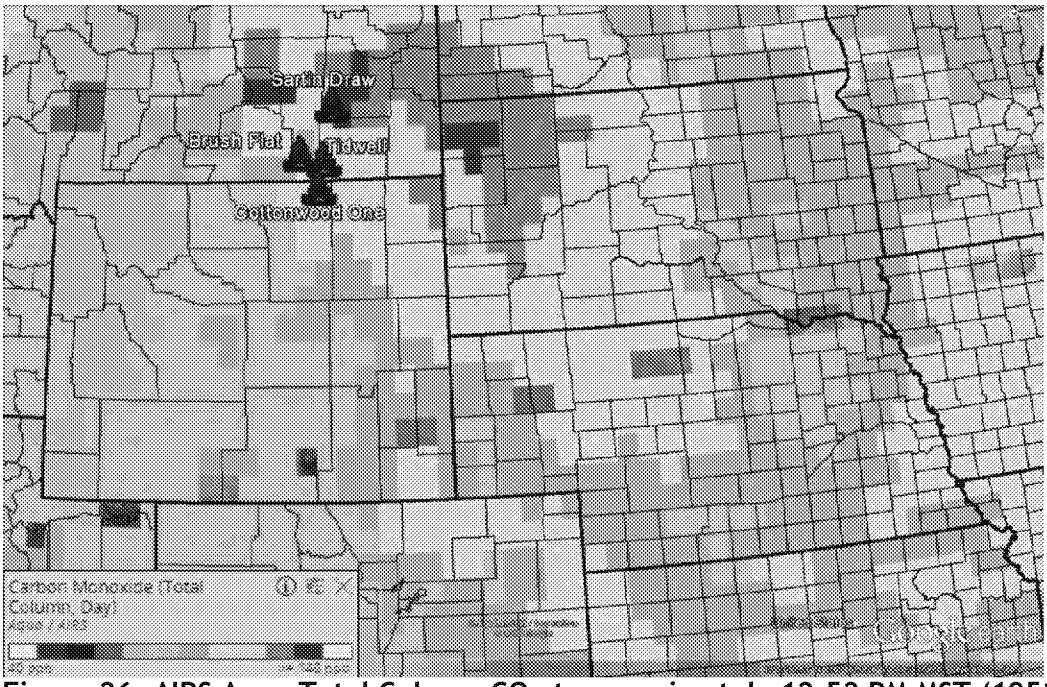


Figure 26: AIRS Aqua Total Column CO at approximately 12:52 PM MST (1952Z) September 2, 2017. (source: https://worldview.earthdata.nasa.gov/)

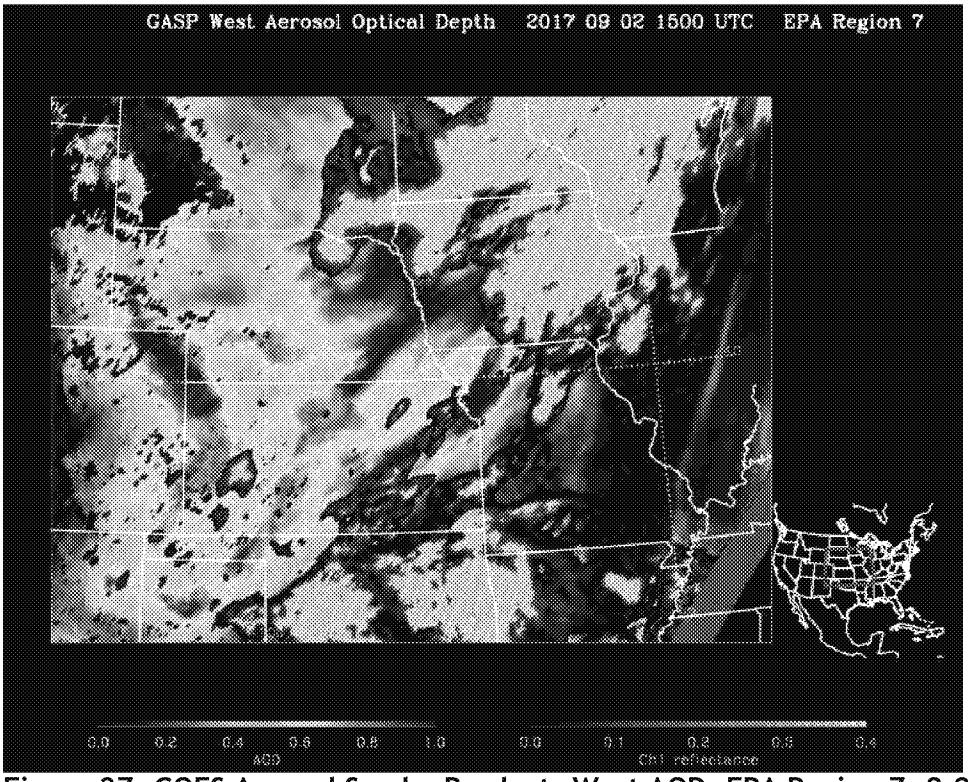


Figure 27: GOES Aerosol Smoke Products West AOD, EPA Region 7, 8:00 AM MST (15Z) September 2, 2017. (source: https://www.star.nesdis.noaa.gov/smcd/spb/aq/)

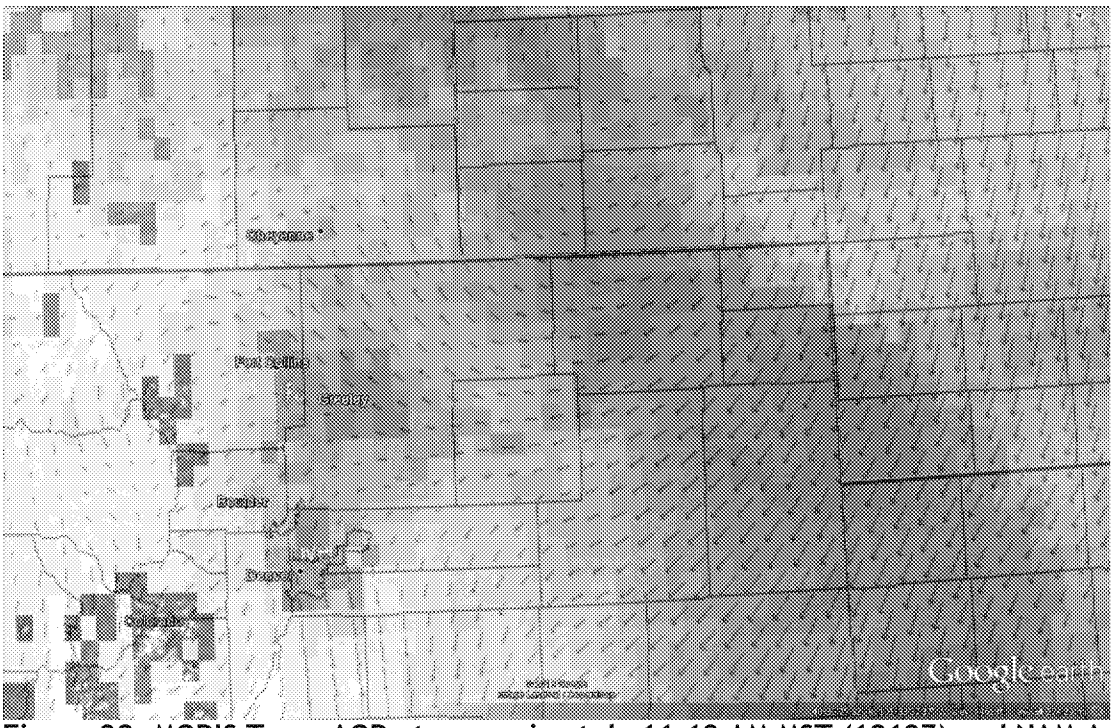


Figure 28: MODIS Terra AOD at approximately 11:12 AM MST (1812Z) and NAM Analysis wind vectors at 11:00 AM MST (1800Z) on September 2, 2017.
(source: https://worldview.earthdata.nasa.gov/)

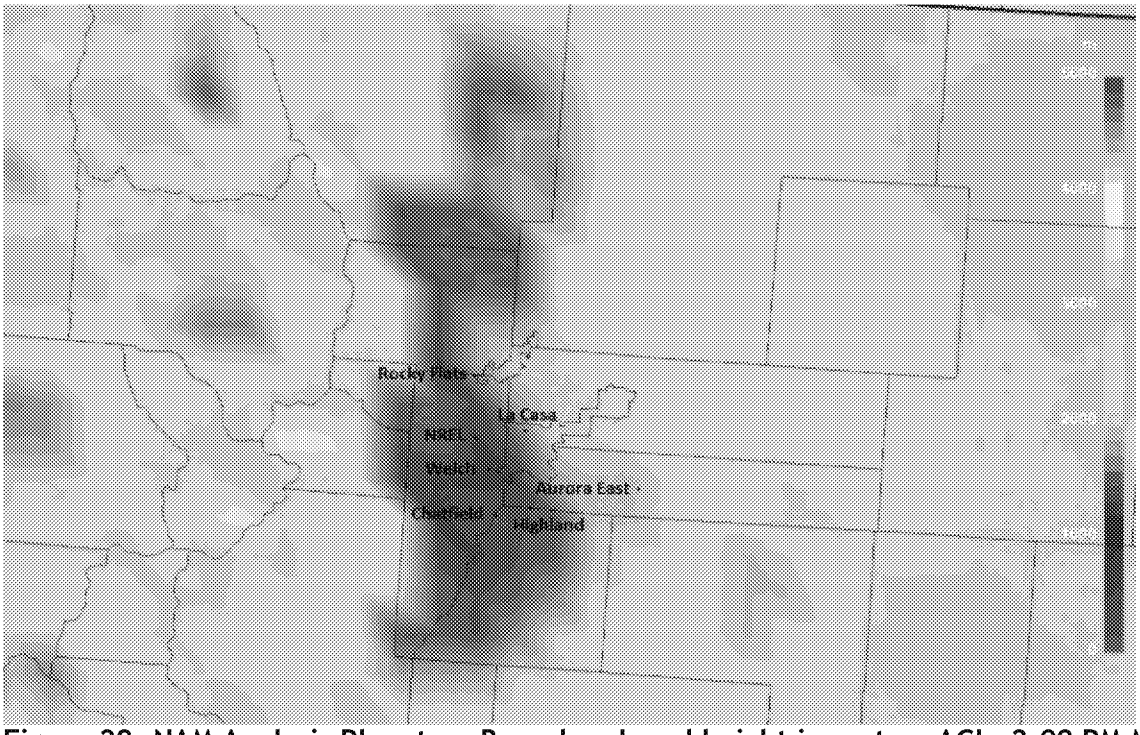


Figure 29: NAM Analysis Planetary Boundary Level height in meters AGL, 2:00 PM MST (21Z) September 2, 2017. (source: https://nomads.ncdc.noaa.gov/thredds/catalog.html)

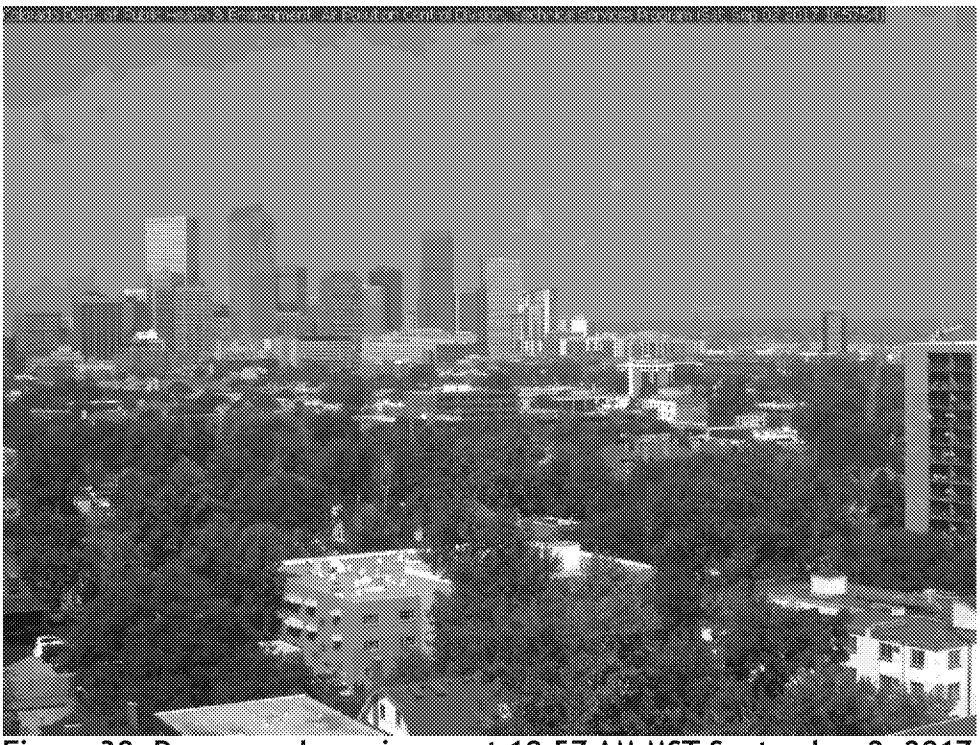


Figure 30: Denver webcam image at 10:57 AM MST September 2, 2017. (source: https://www.colorado.gov/airquality/live_image.aspx)

Figure 31: Denver webcam image at 10:57 AM MST September 2, 2015. (source: https://www.colorado.gov/airquality/live_image.aspx)

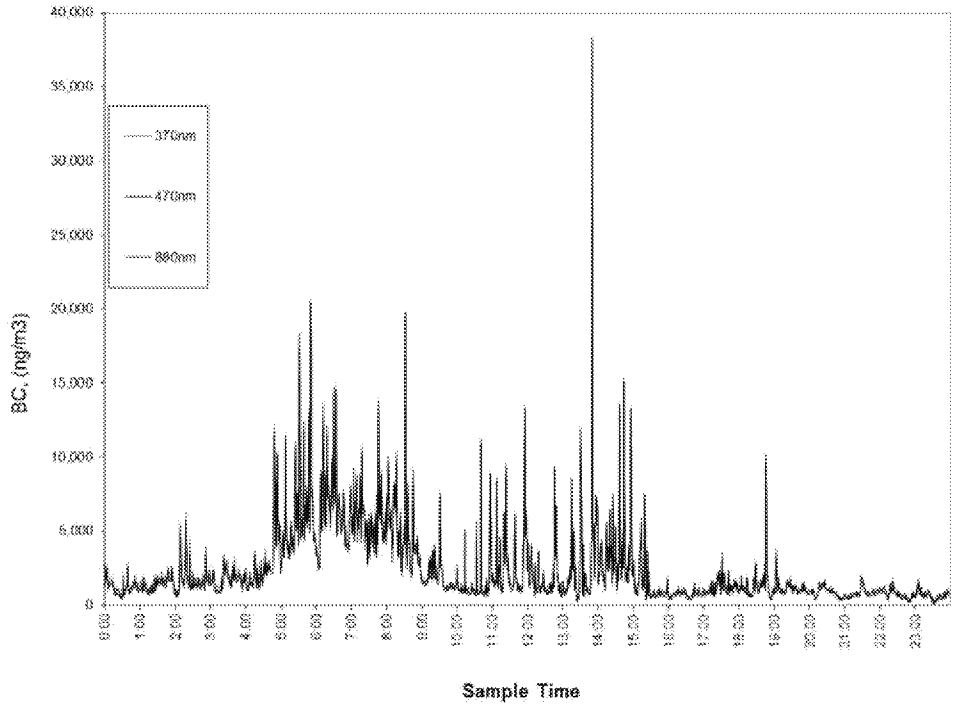


Figure 32: Black carbon absorption from APCD's near-road aethalometer measurement in central Denver on August 30, 2017.

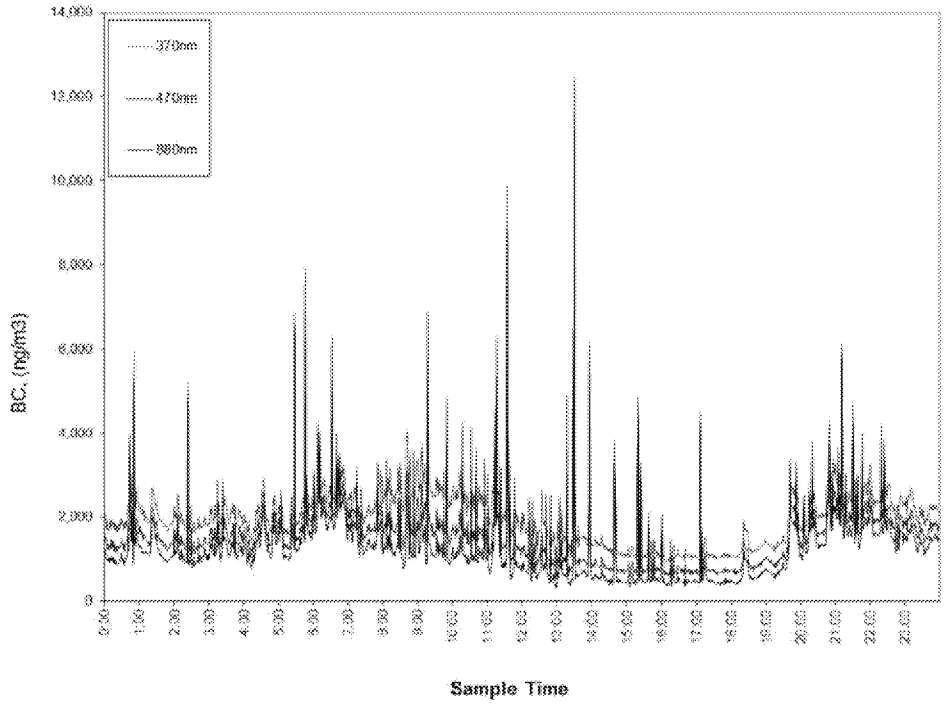


Figure 33: Black carbon absorption from APCD's near-road aethalometer measurement in central Denver on September 2, 2017.

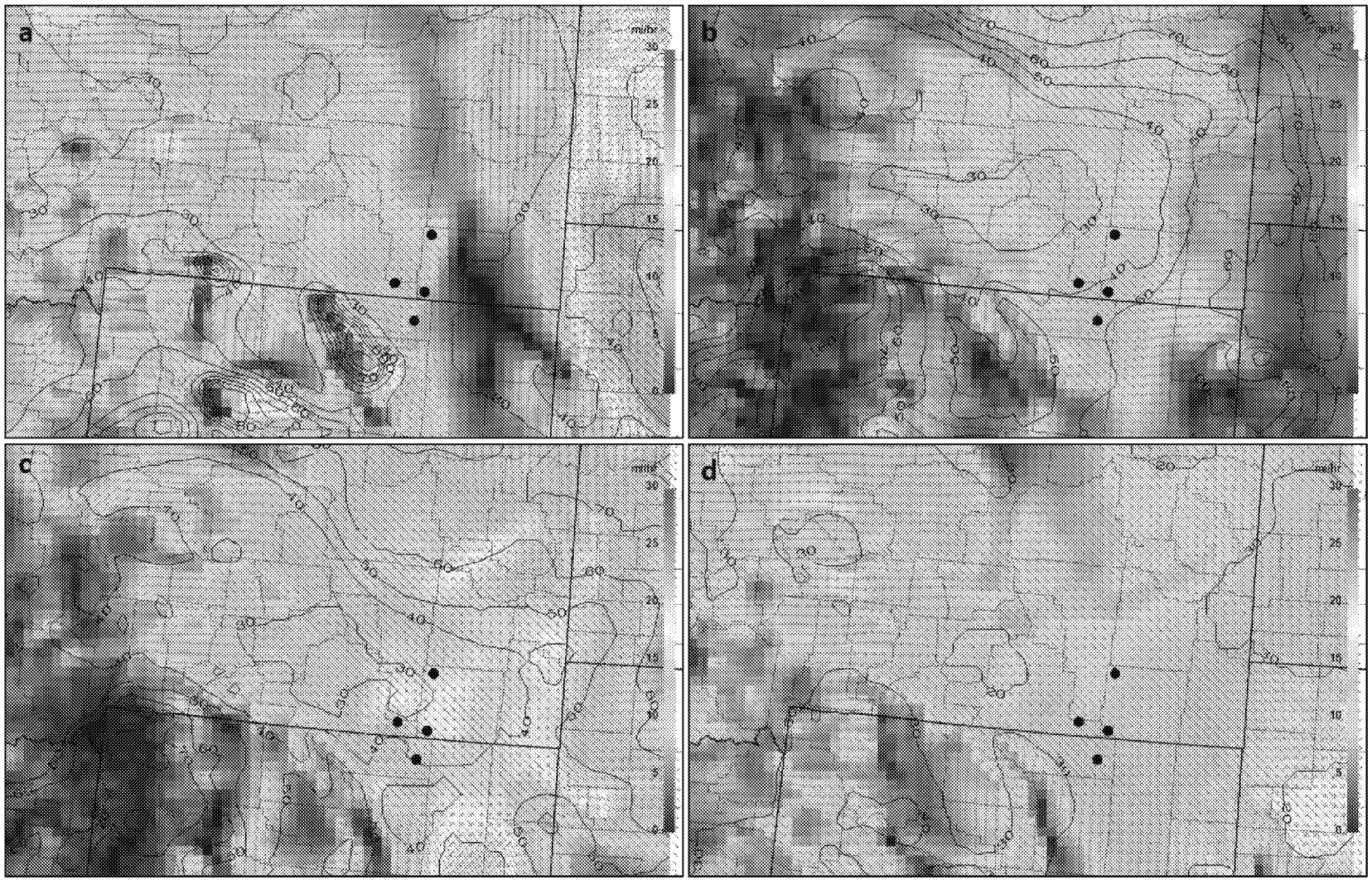
Trajectories, as well as satellite and surface observations in the previous figures establish that smoke from wildfires in northeastern Wyoming and southeastern Montana was transported to the DM/NFR area and was present at the identified monitor locations during the O_3 exceedances of September 2, 2017. Most impactful on the September 2, 2017 O_3 exceedance event were smoke emissions from this region on August 31 and September 1, 2017. During this period, four wildfires were reported: Cottonwood One in Wyoming, and Tidwell, Brush Flat, and Sartin Draw in Montana. Information regarding each wildfire's development was gathered from a number of sources. High-resolution maps with infrared (IR) detection for fire parameters were used as the primary source to determine daily acres burned information. In most cases, these types of maps were available through Inciweb (https://inciweb.nwcg.gov/). When detailed daily emergency response briefing maps were not available, agency reports, news releases, and social media were compiled from various sources that demonstrate clear evidence of fire growth. This information is available in Appendix C.

Over 170,000 cumulative acres burned on August 31 and September 1, 2017 in these four wildfires, none of which were human caused. While not one individual fire in this region crossed into 'mega-fire' status (over 100,000 acres), fire growth and development during these days was extreme. Dangerous fire weather was observed on August 31, 2017 as well as overnight into September 1, 2017 and throughout the day in northeastern Wyoming and southeastern Montana, as evidenced in Figures 34a-d with sustained west to northwest surface winds at or above 15 mph and relative humidity dipping well below 30%. Miles City, MT, the closest weather observation station to Sartin Draw, experienced a high temperature of 96°F, a minimum relative humidity of 14%, with maximum wind speed of 23 mph and maximum wind gust of 29 mph on August 31, 2017. At the same location on September 1, 2017 the high temperature reached 84°F, a minimum relative humidity of 22%, with maximum wind speed of 20 mph and maximum wind gust of 23 mph.

Based on EPA's Guidance, a Tier 2 approach is most appropriate to suffice the clear causal relationship requirement. This approach necessitates an analysis of NO_x and VOC emissions (Q, tons per day) from relevant wildfires compared to distance (D) in kilometers from the affected monitor to the wildfire location. The U.S. Forest Service AirFire BlueSky Playground v2.0 *beta* program was used to model NO_x and VOC emissions from these four fires on August

31 and September 1, 2017 (for more information on BlueSky Playground: https://www.airfire.org/data/playground/). Locations used to model each fire was based on the latitude and longitude of the ignition point as reported in Inciweb. If fire location information was unavailable in Inciweb, intelligence and dispatch reports were utilized from regional offices of the Geographic Area Coordination Centers (https://gacc.nifc.gov/). Fuel types were determined from LANDFIRE's Fuel Characteristic Classification System (FCCS) based on fire location. Fuel moisture content was modeled as "very dry" determined by long-term drought conditions, coupled with above normal temperatures and below normal precipitation in the region over the two months prior to this episode. Emissions from each fire for each day (Q) is the sum of NO_x and VOC emissions from that fire for acres burned during that day. In the case of multiple fires, EPA's Guidance suggests using an emissions weighted distance for D. Thus, determining total Q/D as the sum of NO_x and VOC emissions from each fire on each day, divided by the emissions weighted distance (detailed in EPA's Guidance). Table 11 contains pertinent information for determining overall Q/D for the September 2, 2017 O_3 exceedance. Aggregating fires over the two days in the source region affecting the DM/NFR area's O_3 resulted in a Q/D of 224.9, largely surpassing the Q/D greater than 100 threshold suggested by EPA's Guidance.

Technical analysis of the clear causal relationship between wildfire smoke and O_3 exceedance in the DM/NF area on September 2, 2017 has been demonstrated by examining the meteorological conditions, transport winds and trajectories, wildfire locations and emissions, as well as additional evidence of smoke at the impacted monitors using satellite and ground observations. Accordingly, this demonstration provides sufficient evidence that these fire emissions were transported to the monitors and the wildfires influenced the monitored concentrations, as well as quantification of the wildfire's emissions that contributed to the monitored O_3 exceedances on September 2, 2017.



Figures 34a-d: Surface relative humidity isopleths, wind vectors, and wind speed color contours from NAM analysis with fire locations (black dots) at (a) 2:00 PM MST (21Z) August 31, 2017, (b) 5:00 AM MST (12Z) September 1, 2017, (c) 8:00 AM MST (15Z) September 1, 2017, (d) 2:00 PM MST (21Z) September 1, 2017.

Table 11: Wildfire information for fires affecting September 2, 2017 O_3 exceedances.

Fire	Lat	Long	Cause	Burned on	Acres Burned	NOx (tpd)	VOCs (tpd)	Distance (km)	Q (tpd)	Q/D (tpd/km)
Cottonwood One	44.682	-106.252	*unknown*	8/31/17	3500	77.4	3743.2	556.23	3820.6	6.9
Tidwell	45.042	-106.158	*lightning*	8/31/17	10000	221.0	10694.8	594.71	10915.9	18.4
Brush Flat	45.123	-106.586	*lightning*	8/31/17	20000	149.8	1231.4	609.24	1381.2	2.3
Sartin Draw	45.739	-106.009	*natural*	8/31/17	72130	4204.2	99010.1	670.13	103214.3	154.0
Cottonwood One	44.682	-106.252	*unknown*	9/1/17	656	14.5	701.6	556.23	716.1	1.3
Tidwell	45.042	-106.158	*lightning*	9/1/17	7160	158.3	7657.5	594.71	7815.8	13.1
Brush Flat	45.123	-106.586	*lightning*	9/1/17	53285	399.0	3280.8	609.24	3679.8	6.0
Sartin Draw	45.739	-106.009	*natural*	9/1/17	11000	641.2	15099.3	670.13	15740.4	23.5
				SUM	177731.0	5865.3	141418.7		147284.0	225.5
								Emissions Weighted Distance (km)	654.94	
								Q/Emissions Weighted Distance	**224.9**	

4.2.2 September 4, 2017 Exceedance

On September 4, 2017, nine O_3 monitors experienced high O_3 levels (at or above 0.068 ppm maximum daily 8-hour averaged concentration), with six of those monitors above the 0.070 ppm 2015 NAAQS, and two greater than the 0.075 ppm 2008 NAAQS. The RFN monitor was the highest in the region at 0.078 ppm, or 78 ppb as seen in Figure 35.

To assess the source region of the air in the DM/NFR area during the high O_3 episode of the afternoon of September 4, 2017, a 48-hr HYSPLIT back trajectory is presented in Figure 36. It was initialized with GDAS meteorological data at 500, 1000, and 1500 m AGL, starting 21Z on September 2, 2017 (2:00 PM MST 9/2/17) and ending 21Z September 4, 2017 (2:00 PM MST 9/4/17), revealing the northwestern U.S. as a potential source region. The height levels modeled appear to be an accurate representation of the surface/low-level and mid-level flow in the atmosphere over the source region, with PBL heights for the northwestern U.S. during the initialization time mainly below 2000 m AGL during (Figure 37). As this trajectory covers a large region of the northwestern U.S., an additional HYSPLIT run using HRRR meteorological data was executed.

Figure 38 illustrates both HRRR and GDAS for this same 48-hr time period including active fires on September 2, 2017, the starting time of the back trajectory analysis. Two major source regions of active wildfires emerged including 24 active wildfires during the back trajectory time period: (a) central Washington (Figures 39a) and (b) northern Idaho and western Montana (Figures 39b). During this same time period, the Big Red fire was active in northern Colorado. To verify that smoke from this Colorado fire affected the DM/NFR area, an 18-hr GDAS HYSPLIT forward trajectory was analyzed from the ignition point of the Big Red fire starting at 5:00 PM MST, September 3, 2017 (Figure 40). The PBL height in the vicinity of the Big Red fire was 3000-4000 m AGL during the afternoon of September 3, 2017 (Figure 41). Therefore, forward trajectories from the Big Red fire were modelled at 2000, 2500 and 3000 m AGL. These levels effectively capture the transport winds below the PBL but also keeps the trajectories high enough to most effectively traverse the complex terrain of north-central Colorado. Forward trajectories from the Big Red fire clearly show smoke transport from the fire the afternoon of September 3, 2017 arriving to the DM/NFR area by the late morning of September 4, 2017.

The progression of fires and smoke emissions from September 2-4, 2017 is shown with MODIS Aqua True Color Satellite Imagery and HMS fire detection in Figures 42a-c. Smoke from wildfires in Washington, Idaho and western Montana was directed by west to northwest transport winds, as described in Section 3.3, and transported east and southeastward into eastern Montana and northeastern Wyoming during the September 2-3, 2017 time period. Smoke concentrated and pushed southeastward overnight September 3 into September 4, 2017 as a cold front moved through Montana, into Wyoming and eventually northeastern Colorado as seen in both Figures 42b-c, as well as in the surface weather analysis in Figures 43a-d.

Visual evidence of ground-level smoke in the DM/NFR area is presented in the CDPHE live webcam image in Figures 44a-b, showing heavy smoke in Denver on the morning of September 4, 2017 (Figures 44) and thickening throughout the day (Figures 44). Additional smoke evidence is demonstrated by black carbon aerosols measurements in Figure 45 from APCD's I-25 Denver aethalometer data on September 4, 2017, where separation between shorter and longer wavelengths is observed, confirming the presence of smoke throughout the day.

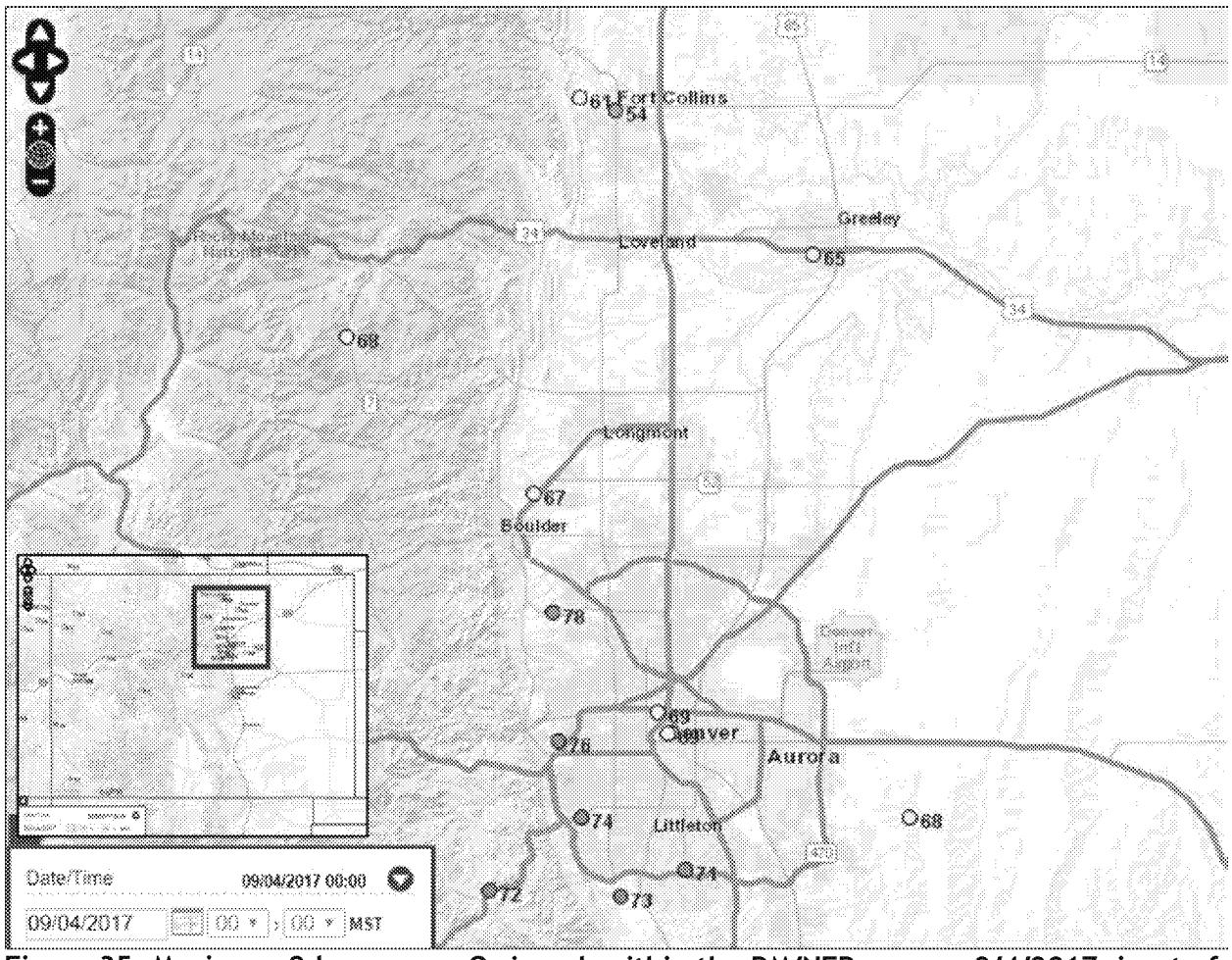


Figure 35: Maximum 8-hr average O_3 in ppb within the DM/NFR area on 9/4/2017, inset of the State of Colorado for geographical reference
(source: https://airnowtech.org/navigator/)

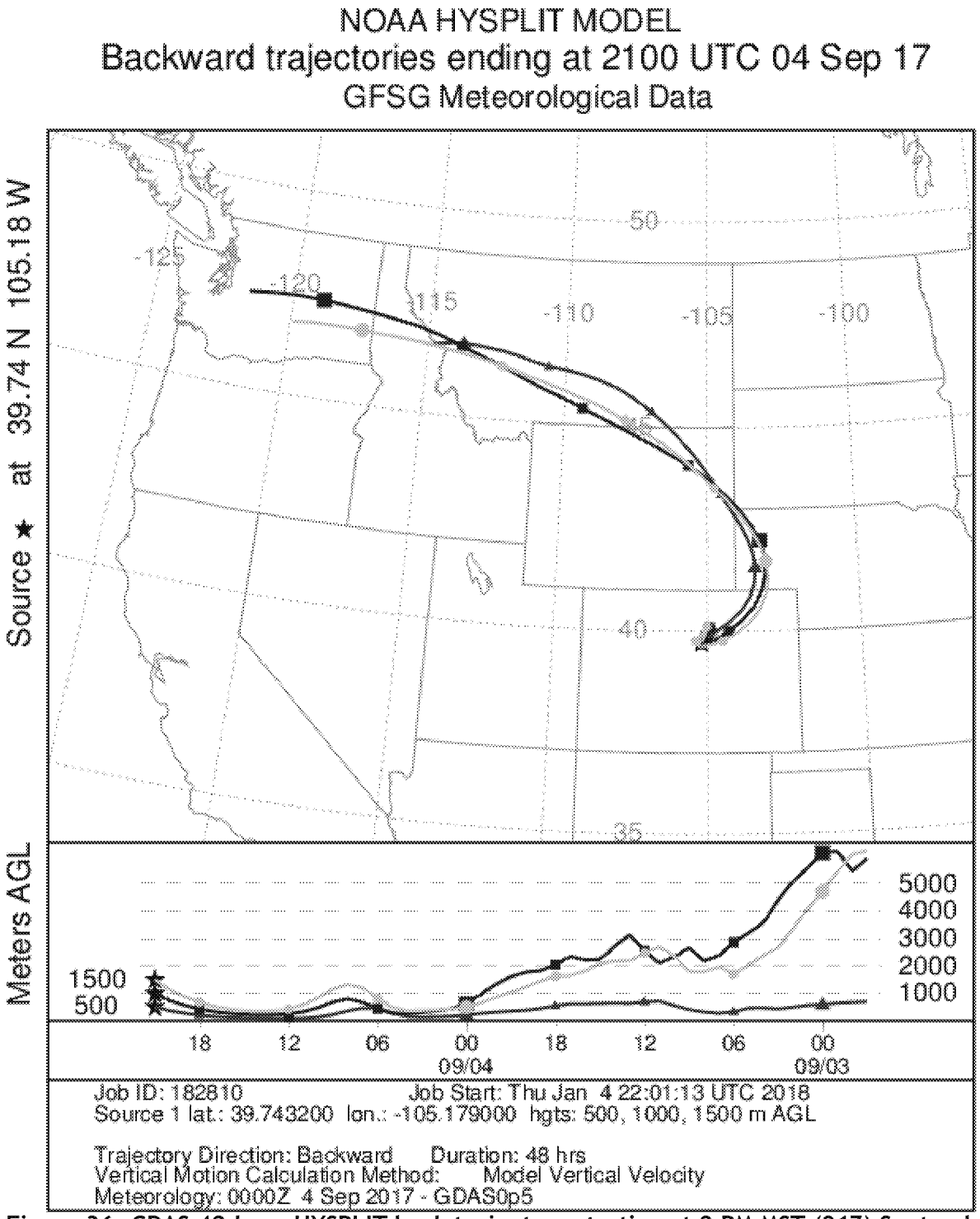


Figure 36: GDAS 48-hour HYSPLIT back trajectory starting at 2 PM MST (21Z) September 2, 2017 and ending at 2 PM MST (21Z) September 4, 2017.
(source: https://ready.arl.noaa.gov/HYSPLIT.php**)**

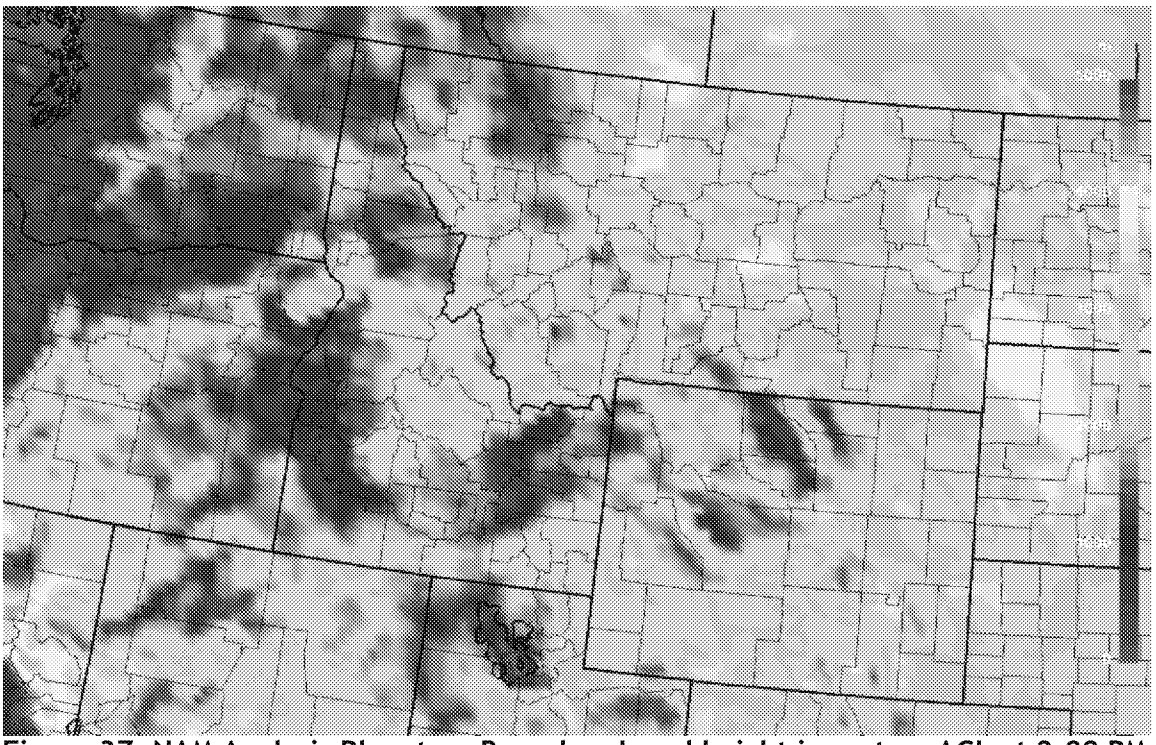


Figure 37: NAM Analysis Planetary Boundary Level height in meters AGL at 2:00 PM MST (21Z) September 2, 2017 (source: https://nomads.ncdc.noaa.gov/thredds/catalog.html)

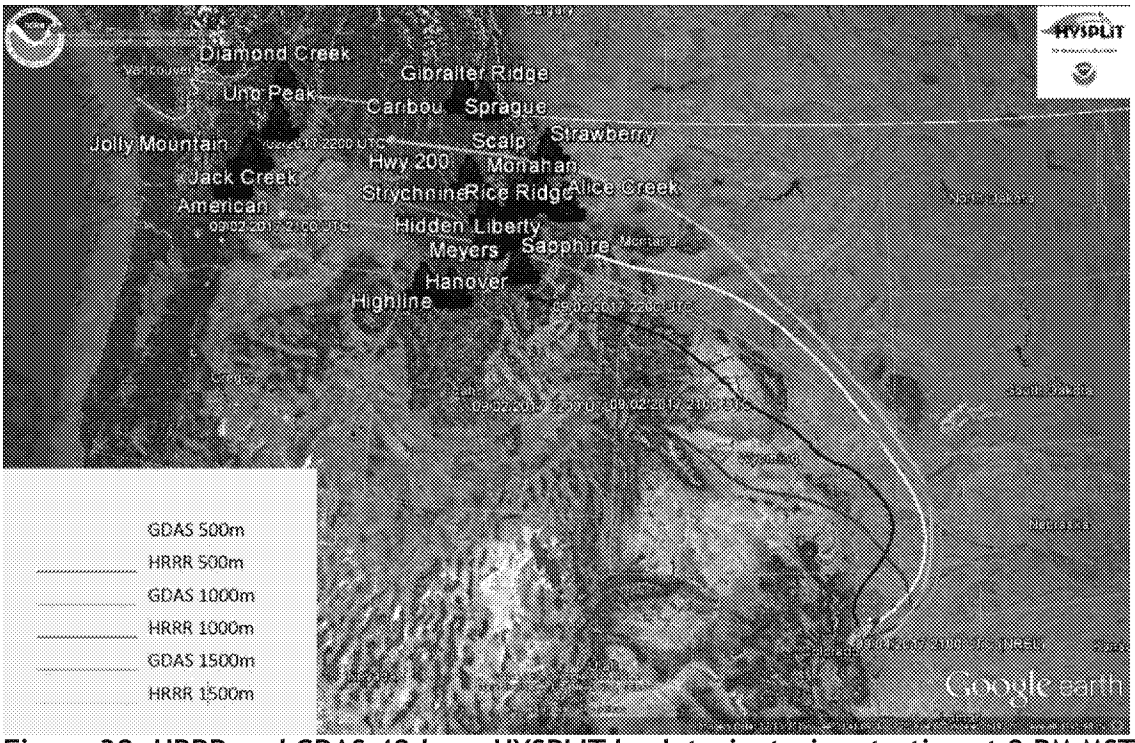
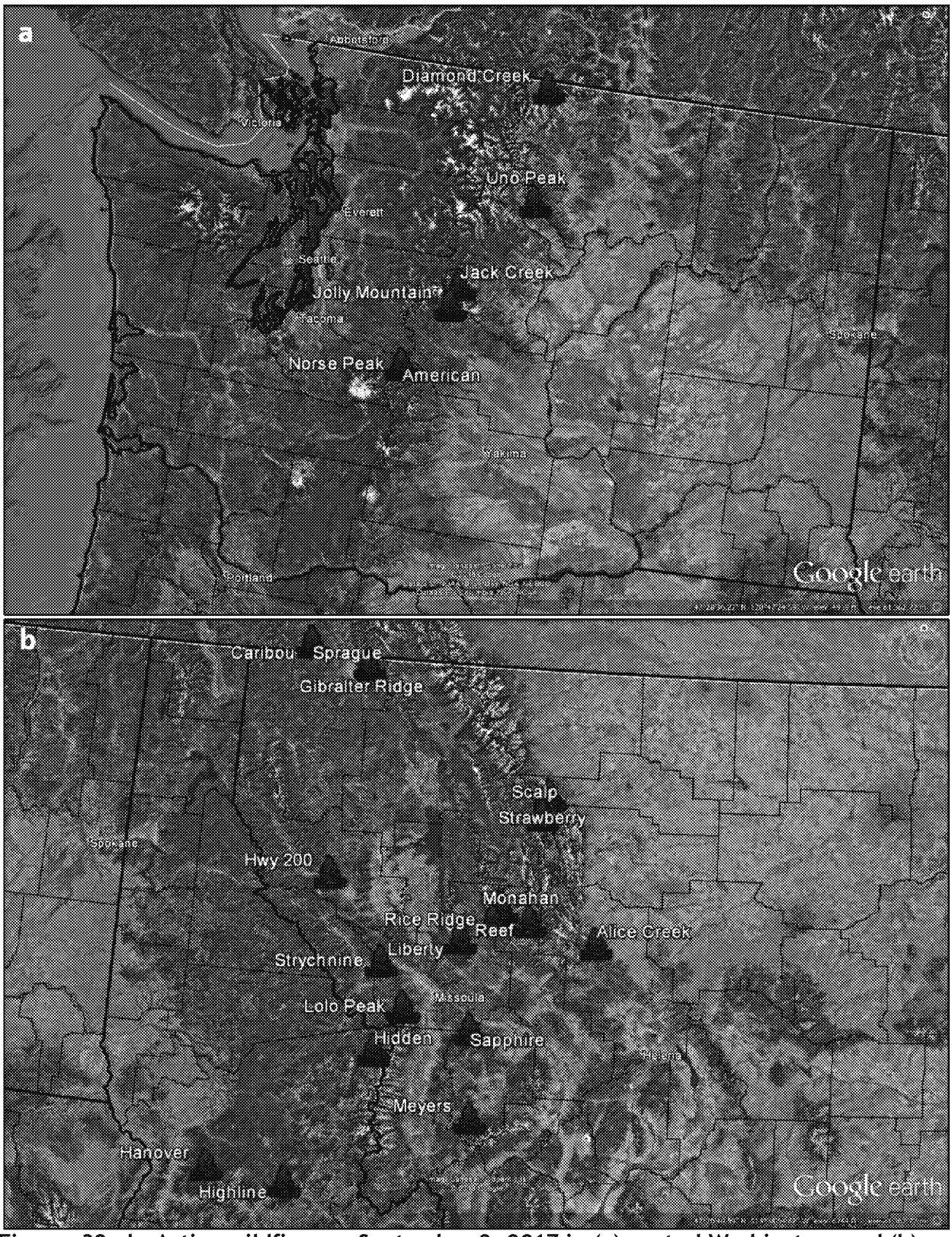


Figure 38: HRRR and GDAS 48-hour HYSPLIT back trajectories starting at 2 PM MST (21Z) September 2, 2017 and ending at 2 PM MST (21Z) September 4, 2017. (source: https://ready.arl.noaa.gov/HYSPLIT.php)



Figures 39a-b: Active wildfires on September 2, 2017 in (a) central Washington, and (b) northern Idaho and western Montana.

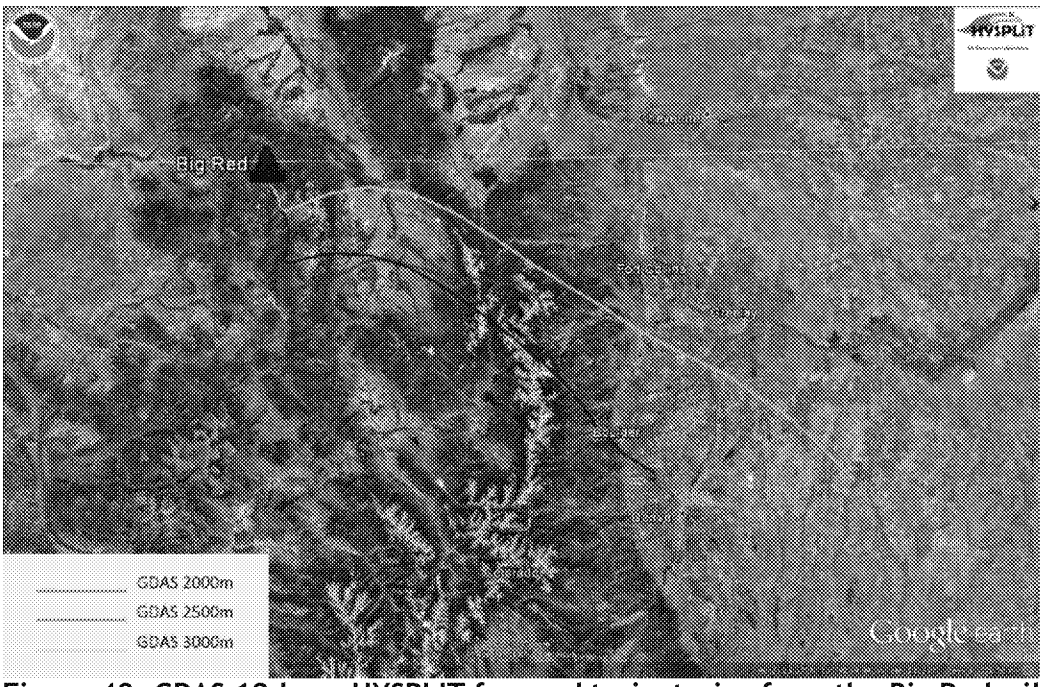


Figure 40: GDAS 18-hour HYSPLIT forward trajectories from the Big Red wildfire at 2000, 2500, and 3000 meters AGL, starting at 5:00 PM MST (0Z September 4, 2017) September 3, 2017 and ending at 11:00 AM MST (18Z) September 4, 2017. (source: https://ready.arl.noaa.gov/HYSPLIT.php)

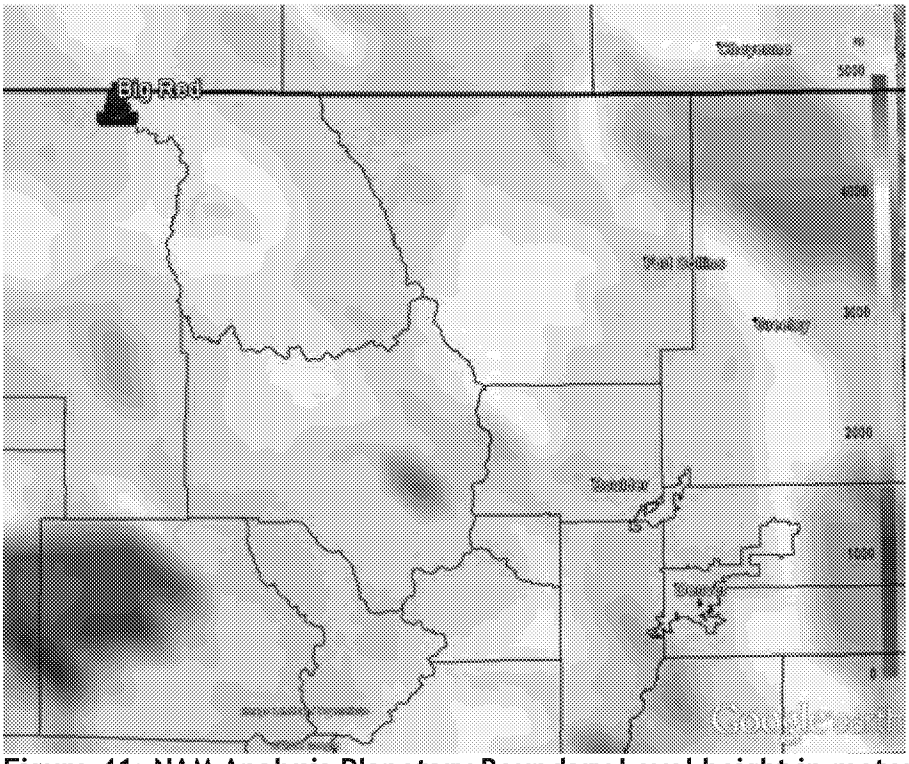
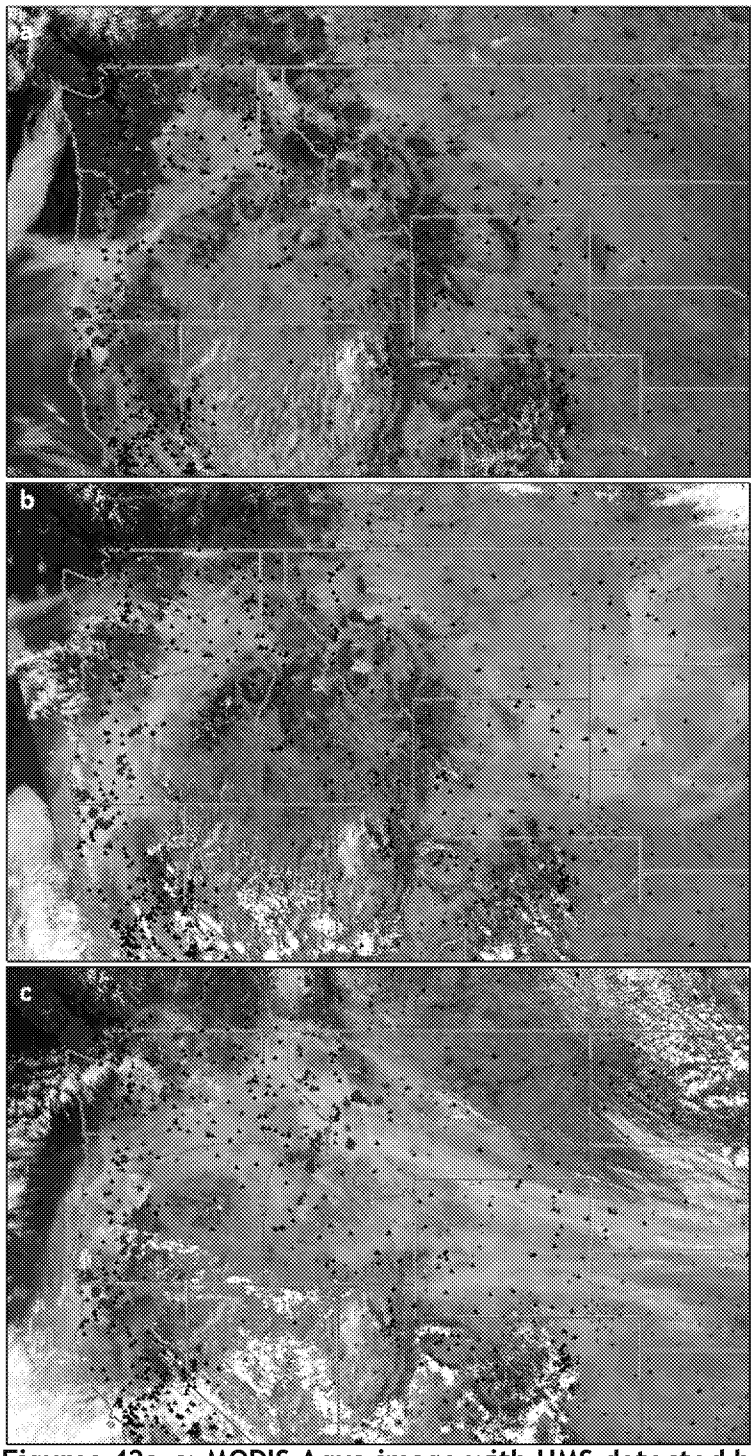
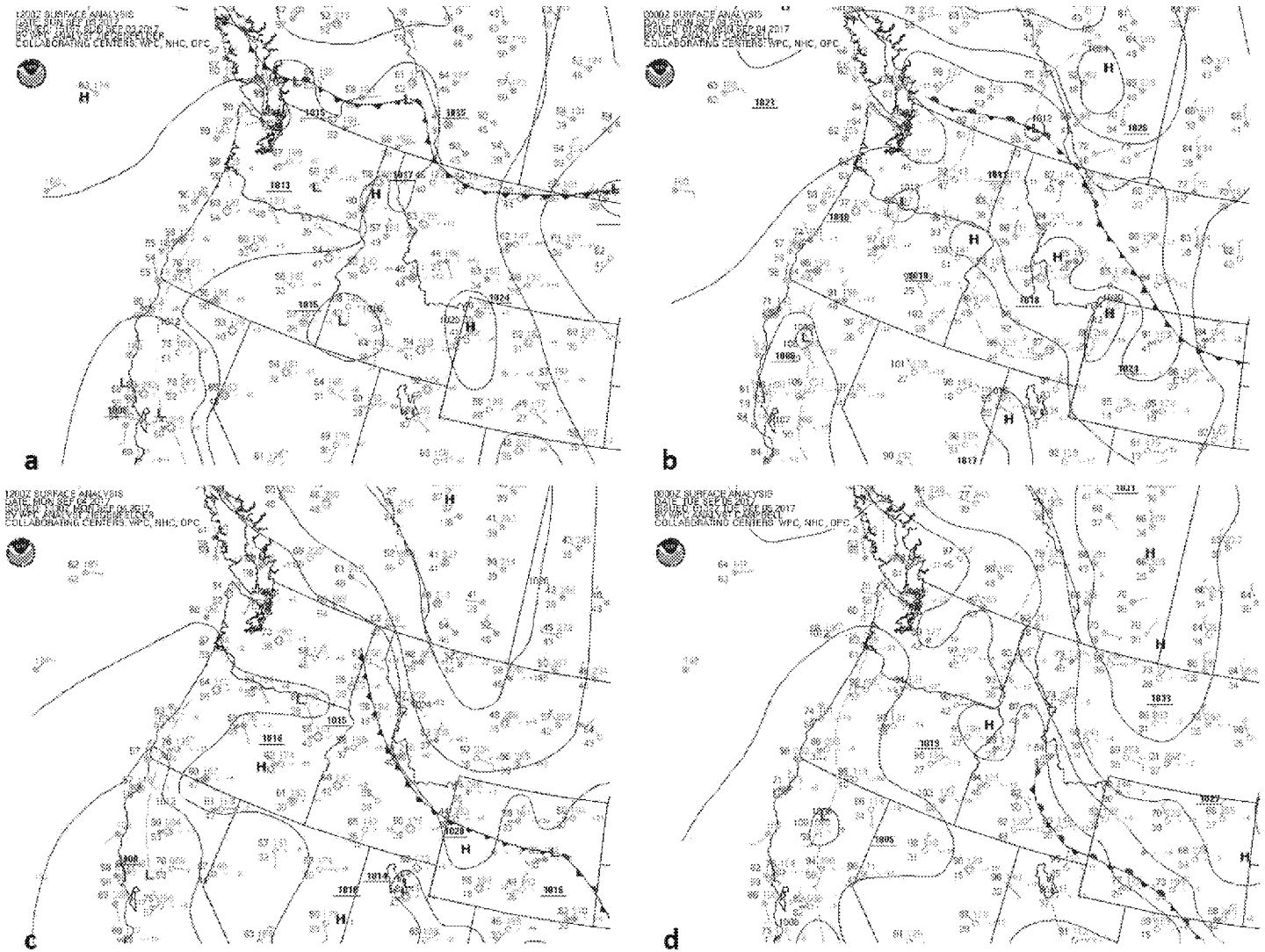


Figure 41: NAM Analysis Planetary Boundary Level height in meters AGL, 2 PM MST (21Z) September 3, 2017. (source: https://nomads.ncdc.noaa.gov/thredds/catalog.html)



Figures 42a-c: MODIS Aqua image with HMS detected hot spots for (a) September 2, 2017 (combined image of two satellite passes with the western half of the image at approximately 2:32 PM MST (2132Z) and the eastern half of image at approximately 12:55 PM MST (1955Z)), (b) September 3, 2017 at approximately 1:37 PM MST (2037Z), and (c) September 4, 2017 (combined image of two satellite passes with the western half of the image at approximately 2:21 PM MST (2121Z) and the eastern half of image at approximately 12:42 PM MST (1942Z). (source: https://airnowtech.org)



Figures 43a-d: NOAA surface analysis for northwestern US at (a) 5:00 AM MST (12z) on September 3, 2017, (b) 5:00 PM MST (0Z 9/4/2017) on September 3, 2017, (c) 5:00 AM MST (12Z) on September 4, 2017, and (d) 5:00 PM MST (0Z 9/5/2017) on September 4, 2017 (source: http://www.wpc.ncep.noaa.gov/)

Figures 44a-b: Denver webcam image at (a) 8:29 AM MST and (b) 2:58 PM MST, on September 4, 2017. (source: https://www.colorado.gov/airquality/live_image.aspx)

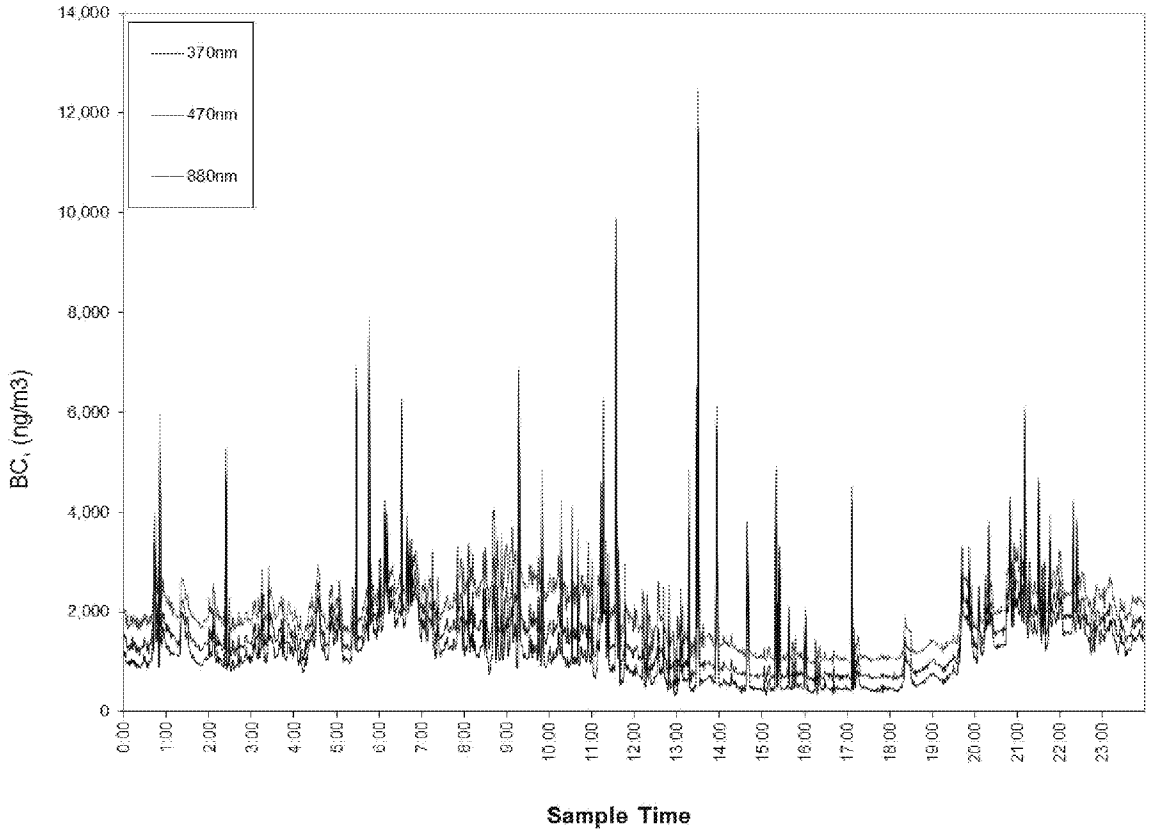


Figure 45: Black carbon absorption from APCD's near-road aethalometer measurement in central Denver on September 4, 2017.

The O_3 exceedance on September 4, 2017 across the DM/NFR area was due to a large wildfire outbreak in the Pacific Northwest and northern Rockies. Prolonged drought and higher than average temperatures set up dangerous wildfire conditions (Section 3.3), and that fire potential manifested. Forward and back trajectories for the September 4 event show contributions from 24 different wildfires. A cold front allowed concentrated smoke to push southeast into Colorado and ground-level smoke was visually observed and measured in the DM/NFR area. To quantify NO_x and VOC emissions from these wildfires, forensic investigation into each of the 24 wildfires involved obtaining detailed information for estimating acres burned. Given the extreme number of fires and mega-fire status of many of the existing fires, emergency response resources were spread thin and consistent/reliable information on the multitude of wildfires was intermittent. Inciweb served as a primary resource for collecting this information (https://inciweb.nwcg.gov/). Where available, high-resolution maps with IR detection for fire parameters were used as the primary source for daily acres burned information. In cases where these maps were not available, agency reports, news releases,

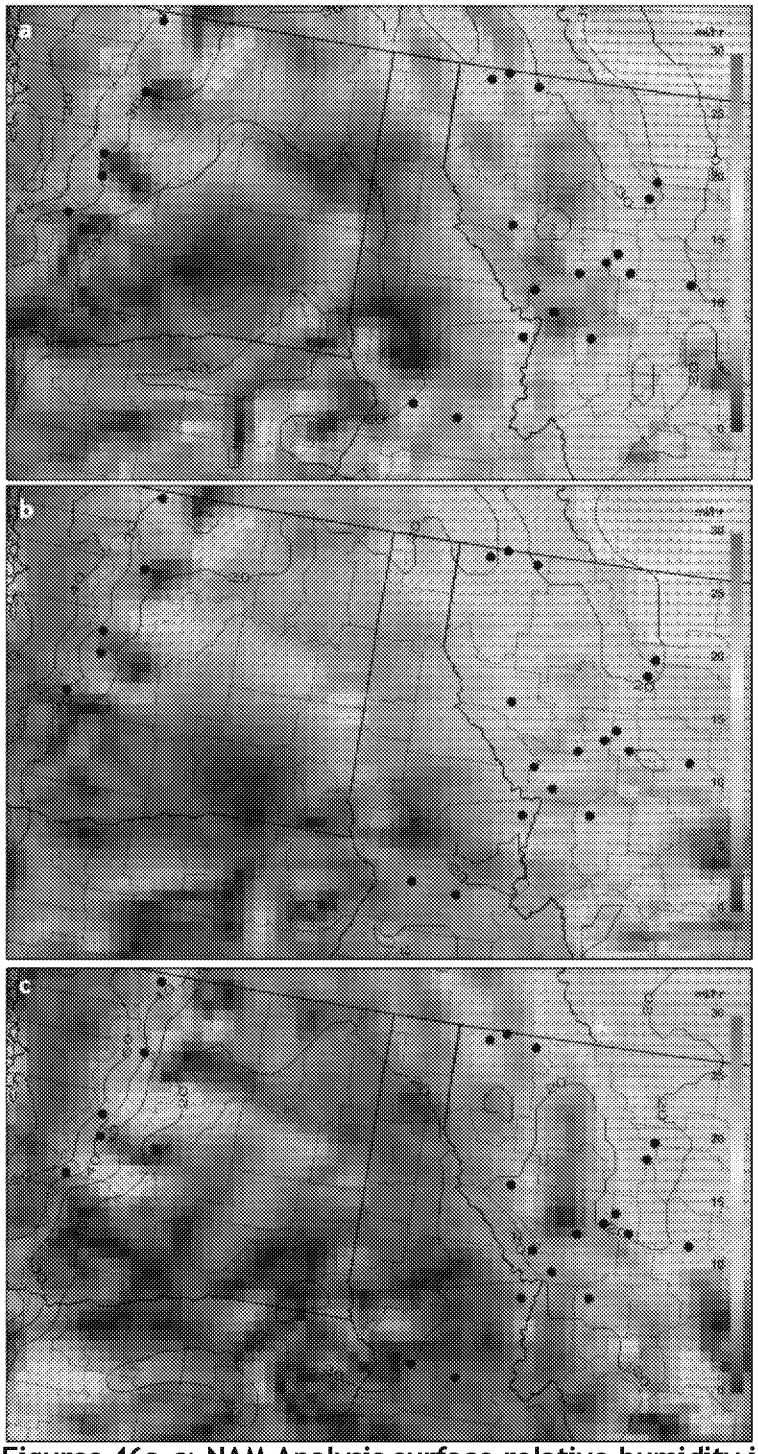
and social media were utilized to compile information. See Appendix C for details on each fire and resources used to estimate fire growth.

Trajectory analysis indicates emissions on September 2, 2017 from wildfires in Washington, Idaho, and Montana contributed to the air mass sampled in the DM/NFR area during the O_3 exceedance on September 4, 2017. Extremely dangerous fire weather was observed on September 2, 2017 in Washington and Idaho/Montana as presented in Figures 46a-c. Winds of 10-15 mph with relative humidity values in the 15-25% range were observed on the Idaho-Montana border midday into early evening on September 2 (Figures 46a-b). In central Washington, low humidity and high wind gusts began later afternoon and picked up with strong downslope winds in the Cascade Mountains increasing into the evening hours (Figures 46c). Ellensburg, WA, one of the closest weather observations to the central Washington fires and representative of a location impacted by the downslope winds, experienced a high temperature of 98°F on September 2, 2017 (the normal high is 79°F), with a minimum relative humidity of 16%, and a maximum wind speed of 19 mph. Missoula, MT the central-most weather station to the Idaho/Montana fires, experienced a record high temperature of 97°F, a minimum relative humidity of 7%, with maximum wind speed of 28 mph on September 2, 2017. Collectively, these conditions made for extremely volatile fire weather with new fires developing and growth from preexisting fires inevitable.

Using the same methodology detailed in the September 2, 2017 exceedance (Section 4.2.1), NO_x and VOC emissions (Q) and emissions weighted distance (D) for the exceedance on September 4 was quantified. Table 12 contains information for determining overall Q/D for the September 4, 2017 O_3 exceedance. Aggregating 24 fires in the source regions affecting Denver's O_3 resulted in a Q/D of 104.3, achieving the Q/D greater than 100 threshold suggested by EPA's Guidance.

Technical analysis of the clear causal relationship between wildfire smoke and O_3 exceedance in the DM/NFR area on September 4, 2017 has been demonstrated by examining the meteorological conditions, transport winds and trajectories, wildfire locations and emissions, as well as additional evidence of smoke at the effected monitors using satellite and ground observations. As a result, this demonstration provides sufficient evidence that these wildfire emissions were transported to the monitors and the wildfires influenced the monitored

concentrations, as well as quantification of the wildfire's emissions that contributed to the monitored O_3 exceedance on September 4, 2017.



Figures 46a-c: NAM Analysis surface relative humidity isopleths, wind vectors, and wind speed color contours with fire locations (black dots) at (a) 2:00 PM MST (21Z) September 2, 2017, (b) 5:00 PM MST (00Z September 3, 2017) September 2, 2017, and (c) 8:00 PM MST (03Z September 3, 2017) September 2, 2017.

Table 12: Wildfire information for fires affecting September 4, 2017 O_3 exceedances.

Fire	Lat	Long	Cause	Burned on	Acres Burned	NOx (tpd)	VOCs (tpd)	Distance (km)	Q (tpd)	Q/D (tpd/km)
Big Red	40.925	-106.884	*lightning*	9/3/17	695	30.9	664.0	195.4	694.9	3.6
Meyers	45.995	-113.580	*lightning*	9/2/17	7163	303.4	6483.6	974.71	6787.1	7.0
Alice Creek	47.154	-112.502	*lightning*	9/2/17	4153	330.2	7202.4	1013.23	7532.7	7.4
Strychnine	46.956	-116.627	*unknown*	9/2/17	800	72.5	1889.3	1013.23	1961.8	1.9
Sapphire Complex	46.563	-113.634	*lightning*	9/2/17	130	5.1	89.1	1021.35	94.2	0.1
Highline / Goat	45.494	-115.233	*lightning*	9/2/17	6649	528.7	11531.2	1040.67	12059.9	11.6
Monahan	47.273	-113.138	*lightning*	9/2/17	231	19.0	508.4	1053.85	527.3	0.5
Hidden	46.381	-114.509	*lightning*	9/2/17	606	48.2	1051.0	1056.67	1099.2	1.0
LoLo Peak	46.674	-114.268	*lightning*	9/2/17	2325	184.9	4032.2	1064.76	4217.1	4.0
Rice Ridge	47.268	-113.485	*lightning*	9/2/17	12730	1012.3	22077.3	1070.59	23089.5	21.6
Reef	47.348	-113.402	*lightning*	9/2/17	1186	97.4	2610.0	1073.15	2707.4	2.5
Liberty	47.139	-113.780	*lightning*	9/2/17	1197	46.8	820.4	1075.07	867.2	0.8
Hanover	45.548	-115.967	*lightning*	9/2/17	1248	99.2	2164.4	1091.73	2263.6	2.1
Strawberry	48.089	-113.015	*lightning*	9/2/17	116	9.5	255.3	1119.08	264.8	0.2
Hwy 200	47.495	-115.060	*lightning*	9/2/17	8807	700.3	15273.7	1171.07	15974.0	13.6
Scalp	47.957	-113.071	*lightning*	9/2/17	1589	130.5	3496.9	1199.98	3627.4	3.0
Sprague	48.607	-113.829	*lightning*	9/2/17	1717	136.5	2977.7	1201.41	3114.3	2.6
Gibralter Ridge	48.857	-114.857	*lightning*	9/2/17	128	10.2	222.0	1270.78	232.2	0.2
Caribou	48.973	-115.441	*lightning*	9/2/17	6890	547.9	11949.1	1308.76	12497.0	9.5
Uno Peak	48.117	-120.377	*unknown*	9/2/17	1300	106.7	2860.9	1527.83	2967.6	1.9
Jolly Mountain	47.377	-121.019	*lightning*	9/2/17	3522	319.9	10697.9	1528.38	11017.8	7.2
Norse Peak / American	46.951	-121.374	*lightning*	9/2/17	977	82.9	2342.2	1530.95	2425.2	1.6
Jack Creek	47.514	-120.959	*lightning*	9/2/17	646	54.8	1548.7	1531.6	1603.5	1.0
Diamond Creek	48.855	-120.414	*unknown*	9/2/17	9042	353.2	6197.7	1576.87	6550.9	4.2
				SUM	73847	5231.0	118945.4		124176.4	109.2
								Emissions Weighted Distance (km)	1190.83	
								Q/Emissions Weighted Distance	**104.3**	

4.2.3 Historical Fluctuations of O_3 Concentrations in the DM/NFR Area

A historical comparison of event related O_3 concentrations with similar seasonal non-event related high O_3 concentrations is required to satisfy key factor #2 in a Tier 2 demonstration, as described in the Guidance. This factor is addressed by demonstrating that the exceedance is either 1) in the 99th percentile of the 5-year distribution of O_3 monitoring data, or 2) one of the four highest O_3 concentrations within one year. A comparison of O_3 monitoring data for sites affected by the September 2 and 4, 2017 wildfire smoke event was made using valid quality assured hourly and daily maximum 8-hour average data values from the Aspen Park, Chatfield, Highland, NREL, Rocky Flats North, and Welch sites from 2011 through 2016. APCD has been monitoring O_3 concentrations at these sites prior to 2011. However, a six year time period was selected for this analysis to keep the statistical comparisons to a time frame that is as representative as possible for the comparison to current climate conditions and emission inventories while still attaining a statistically relevant sample.

Of the sites listed in this evaluation the most important is NREL because its maximum daily 8-hour average O_3 concentrations exceeded the 2008 0.075 ppm O_3 standard and will affect design values in Colorado's NAAQS non-attainment reclassification from "moderate" to "serious" under the 2008 O_3 standard. The other sites reported in this evaluation were selected because they exceeded the 2015 0.070 ppm standard and may contribute to future non-attainment designations under the 2015 O_3 standard. These additional sites were also included to show the geographical extent of the event area.

<u>Historical Comparison of Monthly Values</u>

Historical non-event maximum daily 8-hour average O_3 data used in this evaluation begin on January 1, 2011 and end on December 31, 2016. The exception to this are data from the Highlands site where construction at the site prohibited the collection of O_3 data from October 2013 through August 2015. Historical evaluations of the Highland data are made with a smaller sample size than other sites. Descriptive statistics for the historical data is presented in Table 13, with all data values presented in ppm.

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Table 13: Summary of September Non-Event Maximum Daily 8-hour Average O_3 Data (2011-2016)

Evaluation	Aspen Park 080590013	Chatfield 080350004	Highland 080050002	NREL 080590011	RFN 080590006	Welch 080590005
9/2/2017	--- *	**0.071 ppm**	--- *	**0.076 ppm**	**0.071 ppm**	**0.075 ppm**
9/4/2017	**0.072 ppm**	**0.073 ppm**	**0.071 ppm**	**0.076 ppm**	**0.078 ppm**	**0.074 ppm**
Mean	0.047	0.051	0.049	0.051	0.052	0.046
Median	0.047	0.051	0.050	0.051	0.052	0.047
Mode	0.048	0.056	0.052	0.056	0.046	0.046
St. Dev.	0.008	0.010	0.009	0.010	0.011	0.010
Minimum	0.023	0.017	0.020	0.016	0.018	0.014
99 %ile	0.066	0.071	0.070	0.071	0.078	0.069
Maximum	0.068	0.081	0.073	0.072	0.079	0.071
Range	0.045	0.064	0.053	0.0561	0.061	0.057
Count	172	179	146	177	176	176

* Not requested for event concurrence

Table 14 shows the max daily 8-hour average O_3 concentrations for the September 2 & 4, 2017 events as a percentile of six years of historical data for the month of September for years 2011 to 2016. All sites exceeded the 99th percentile threshold except RFN, which reported 96.5 and 98.8 percentiles for the September 2 & 4 events, respectively. Maximum values were observed at Aspen Park, NREL and Welch sites.

Table 14: September 2 and 4, 2017 Event Percentiles of Max Daily 8-hour Average O_3 for September 2011 to 2016 Data

Event Percentiles for Monthly September Data						
Evaluation	Aspen Park 080590013	Chatfield 080350004	Highland 080050002	NREL 080590011	RFN 080590006	Welch 080590005
9/2/2017	--- *	**0.071 ppm**	--- *	**0.076 ppm**	**0.071 ppm**	**0.075 ppm**
9/4/2017	**0.072 ppm**	**0.073 ppm**	**0.071 ppm**	**0.076 ppm**	**0.078 ppm**	**0.074 ppm**
9/2/2017	---	99.0 %ile	---	Max Value	96.5 %ile	Max Value
9/4/2017	Max Value	99.4 %ile	99.1 %ile	Max Value	98.8 %ile	Max Value

* Not requested for event concurrence

Figure 47, Figure 48, and Figure 49 are monthly non-event historical comparison plots that show the historical seasonal variability for the max daily 8-hour average O_3 concentrations for

complete calendar years 2011 to 2016. The graphs are time series that show the 5th, 50th and 99th percentile of the historical data for each month of the year. Maximum concentrations are shown as purple dashes above the 99th percentile line. The maximum daily 8-hour O_3 concentrations for each event day are plotted on each graph as either a black "X" and/or a green triangle. This allows for a graphical representation of the comparison between event concentrations and historical seasonal concentrations. The horizontal dashed red lines represent the 2008 0.075 ppm and the 2015 0.070 ppm O_3 NAAQS levels.

Historical Comparison of 2-Week Window Values

Historical non-event max daily 8-hour average O_3 data used in this evaluation begin on August 26 and end on September 11 for years 2011 to 2016 (a week before and after the September 2 and September 4 events). The exception to this is Highland site data where construction at the site prohibited the collection of O_3 data from October 2013 through August 2015. Historical evaluations of the Highland data are made with a smaller sample size than others sites. The descriptive statistics for this historical data are presented in Table 15, with all data values presented in ppm.

Table 15: Summary of 2-Week Non-Event Max Daily 8-hr Average O_3 Data (August 26 to September 11, 2011-2016)

Comparison of Event Data 2-Week Non-Event Historical Summary Data						
Evaluation	Aspen Park 080590013	Chatfield 080350004	Highland 080050002	NREL 080590011	RFN 080590006	Welch 080590005
9/2/2017	--- *	**0.071 ppm**	--- *	**0.076 ppm**	**0.071 ppm**	**0.075 ppm**
9/4/2017	**0.072 ppm**	**0.073 ppm**	**0.071 ppm**	**0.076 ppm**	**0.078 ppm**	**0.074 ppm**
Mean	0.050	0.055	0.056	0.056	0.057	0.052
Median	0.050	0.055	0.057	0.057	0.058	0.052
Mode	0.050	0.055	0.059	0.059	0.064	0.049
St. Dev.	0.009	0.011	0.010	0.011	0.011	0.011
Minimum	0.032	0.021	0.030	0.018	0.019	0.017
95 %tile	0.066	0.073	0.073	0.071	0.071	0.069
99 %tile	0.072	0.081	0.080	0.075	0.078	0.073
Maximum	0.080	0.086	0.085	0.084	0.079	0.080
Range	0.048	0.065	0.055	0.066	0.060	0.063
Count	93	99	78	102	98	101

* Not requested for event concurrence

Table 16 shows the maximum daily 8-hour average O_3 concentrations for the September 2 and 4, 2017 events as a percentile of six years of historical data from 2011 to 2016 (August 26 to September 11). Two sites, NREL and Welch, met or exceeded the 99th percentile threshold for both the September 2, 2017 event and three sites, Aspen Park, NREL and Welch, met or exceeded the 99th percentile threshold for the September 4, 2017 events. No maximum values were observed at any of the sites.

Table 16: September 2 & 4, 2017 Event Percentiles for Max Daily 8hr Average O_3 for August 26 to September 11, 2011 to 2016 Data

Event Percentiles for 2-Week Data Window						
Evaluation	Aspen Park 080590013	Chatfield 080350004	Highland 080050002	NREL 080590011	RFN 080590006	Welch 080590005
9/2/2017	--- *	**0.071 ppm**	--- *	**0.076 ppm**	**0.071 ppm**	**0.075 ppm**
9/4/2017	**0.072 ppm**	**0.073 ppm**	**0.071 ppm**	**0.076 ppm**	**0.078 ppm**	**0.074 ppm**
9/2/2017	---	92.8 %ile	---	99.1 %ile	94.1 %ile	99.2 %ile
9/4/2017	99.0 %ile	94.8 %ile	92.2 %ile	99.1 %ile	97.9 %ile	99.1 %ile

* Not requested for event concurrence

Figure 50, Figure 51 and Figure 52 are 2-week non-event historical comparison plots that show the variability of the maximum daily 8-hour O_3 concentrations for the sites of interest for the time period August 26 to September 11 for years 2011 to 2016. The graphs show the maximum daily 8-hour average O_3 by date for each year. The dashed line represents the 99th percentile of all data displayed on the plot. The maximum daily 8-hour O_3 concentrations for each event day are plotted on each graph as either a blue or red circle. This allows for a graphical representation of the comparison between event concentrations and historical seasonal concentrations.

Historical Comparison of Hourly Diurnal Values

Figure 52, Figure 53, and Figure 54 are graphs of diurnal deviation from normal comparisons. These show the historical diurnal variability for hourly averaged data for the sites of interest for a two week time interval from August 26 to September 11 (a week before and after the 9/2 and 9/4 events) for a five-year time period from 2013 to 2017. The graphs are hourly time series box and whisker plots for daily 24 hour periods. The box and whisker plots graphically represent the overall distribution of each data set including the mean (◊), the inner quartile range (IQR, defined to be the distance between the 75th% and 25th%), the median

(represented by the horizontal black line), and maxima and minima (vertical wiskers). The green dots and blue dots represent the the hourly average concentrations at the corresponding site for the September 2 and 4, 2017 events, respectively. These graphs show the diurnal evolution of O_3 concentrations for each site and each event, relative to historical values. The majority of the event values, leading up to the peak concentrations, are above the 75th percentile. The September 2, 2017 event resulted in historical maximum hourly values at Highland (hours 19 to 21), NREL (hours 16 and 17), RFN (hour 8), and Welch (hour 17). The 9/4/17 event resulted in historical maximum hourly values at Aspen Park (hours 5,6,14,15,16, and 19), Chatfield (hour 14), Highland (hours 5,6, and 7), NREL (hours 9 and 13), RFN (hours 5,6,7,12,13, and 14) and Welch (hours 4,5,6,7,13, and 15).

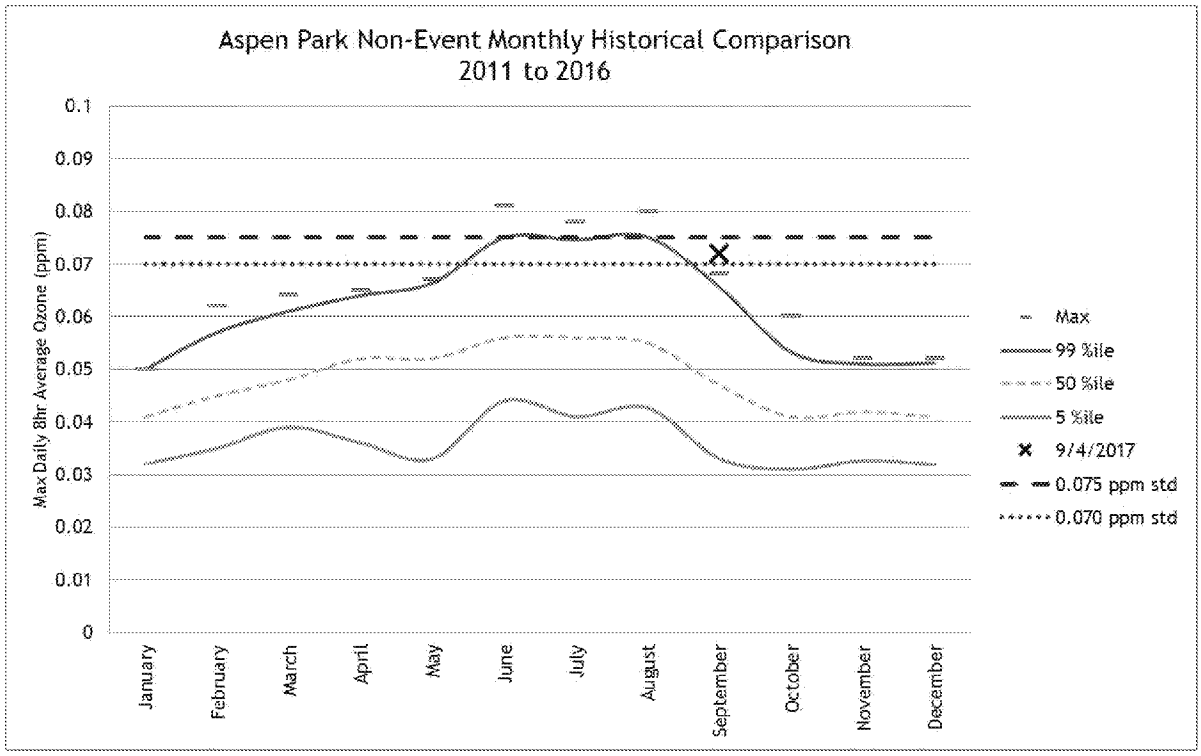
Tier 2 Alternate Test

The alternate Tier 2 test evaluates if the observed event maximum daily 8-hour average concentration(s) are in the top four values observed within one year of data. Rank ordered maximum daily 8-hour average O_3 concentrations for all sites of interest are listed in Table 17, for data from September 4, 2016 to September 4, 2017. In the rank order method, if the ranking value had 1 or more equal ranking values, then all equal ranking values received the same ranking. Equal ranking values higher in the ranking order were assigned their ordinal ranking value. The September 2, 2017 event resulted in NREL (4) and Welch (1) having rank order values in the top four. The September 4, 2017 event resulted in Aspen Park (1), NREL (4), and RFN (1) having rank order values in the top four. These sites have ranking values that meet the secondary key factor #2 threshold.

Table 17: September 2 & 4, 2017 Event Rank Values for Max Daily 8hr Average values for September 4, 2016 to September 4, 2017

(September 2 & 4, 2017 Rank Value of Maximum Daily 8hr Average O3 for September 4, 2016 to September 4, 2017 data)						
Evaluation	Aspen Park 080590013	Chatfield 080350004	Highland 080050002	NREL 080590011	RFN 080590006	Welch 080590005
9/2/2017	--- *	**0.071 ppm**	--- *	**0.076 ppm**	**0.071 ppm**	**0.075 ppm**
9/4/2017	**0.072 ppm**	**0.073 ppm**	**0.071 ppm**	**0.076 ppm**	**0.078 ppm**	**0.074 ppm**
9/2/2017	---	10	---	4	15	1
9/4/2017	1	7	5	4	1	5

* Not requested for event concurrence



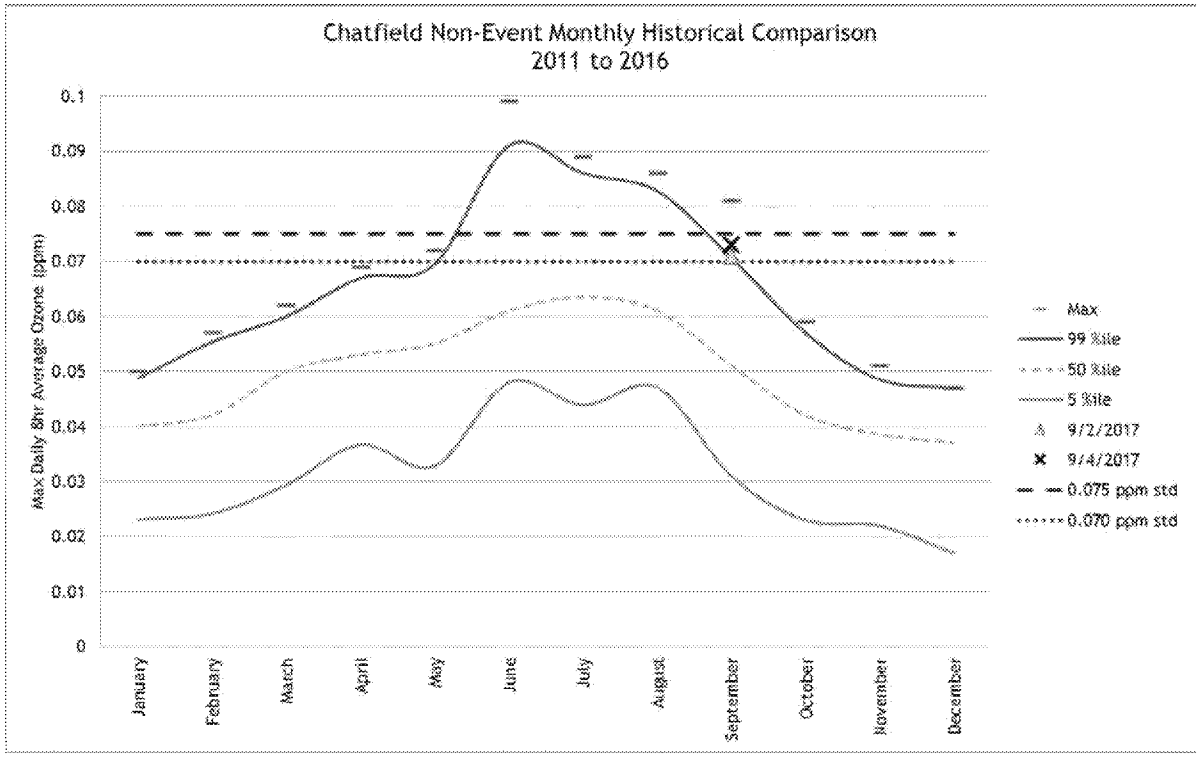
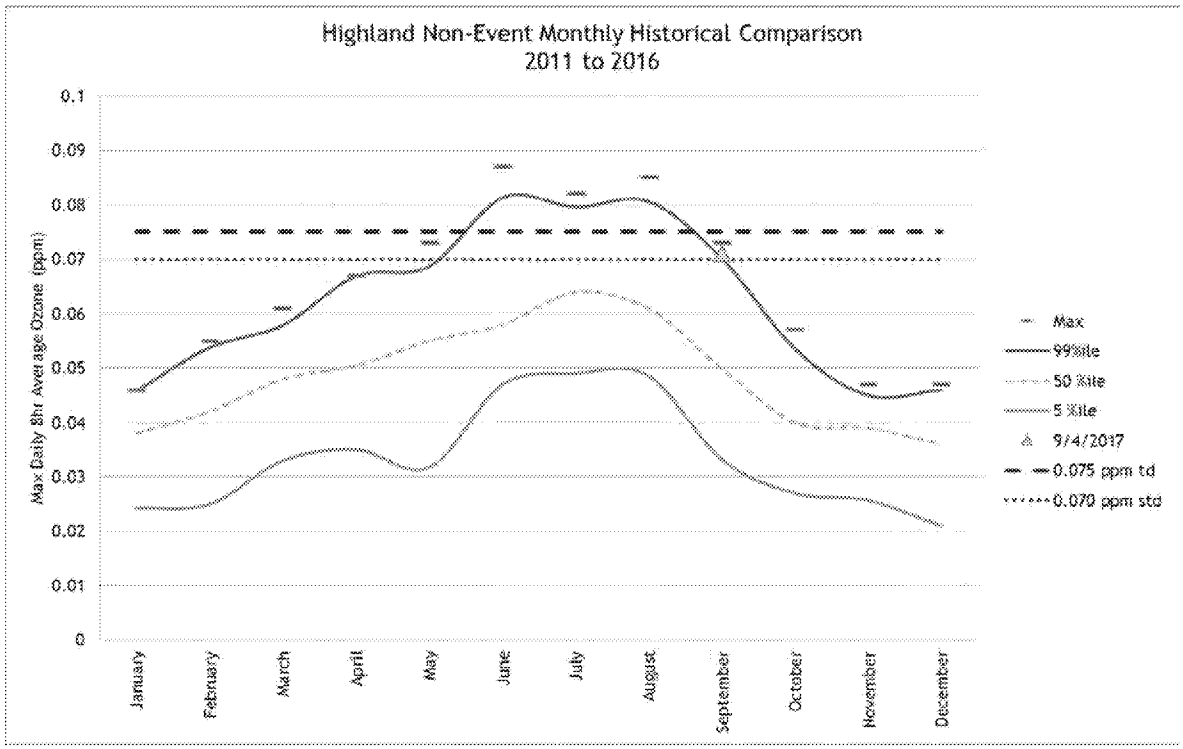


Figure 47: Monthly Non-Event Historical Comparison Plots for Aspen Park (AQS ID 080590013) and Chatfield (AQS ID 080350004)



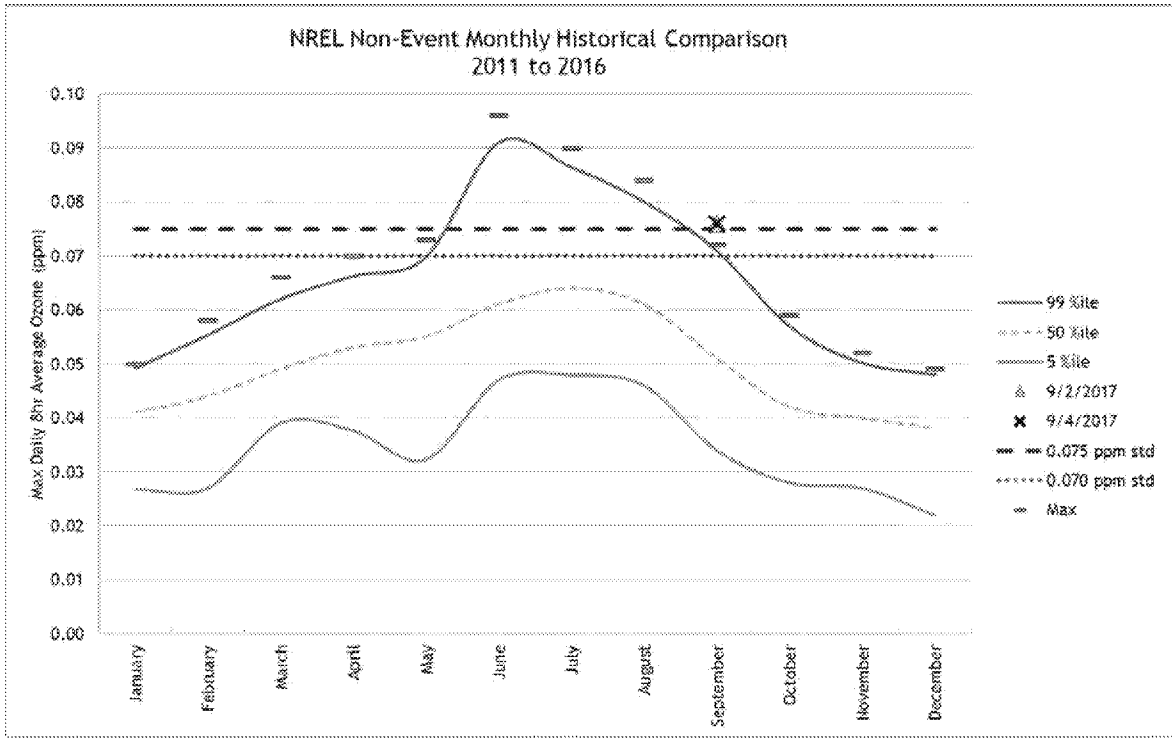
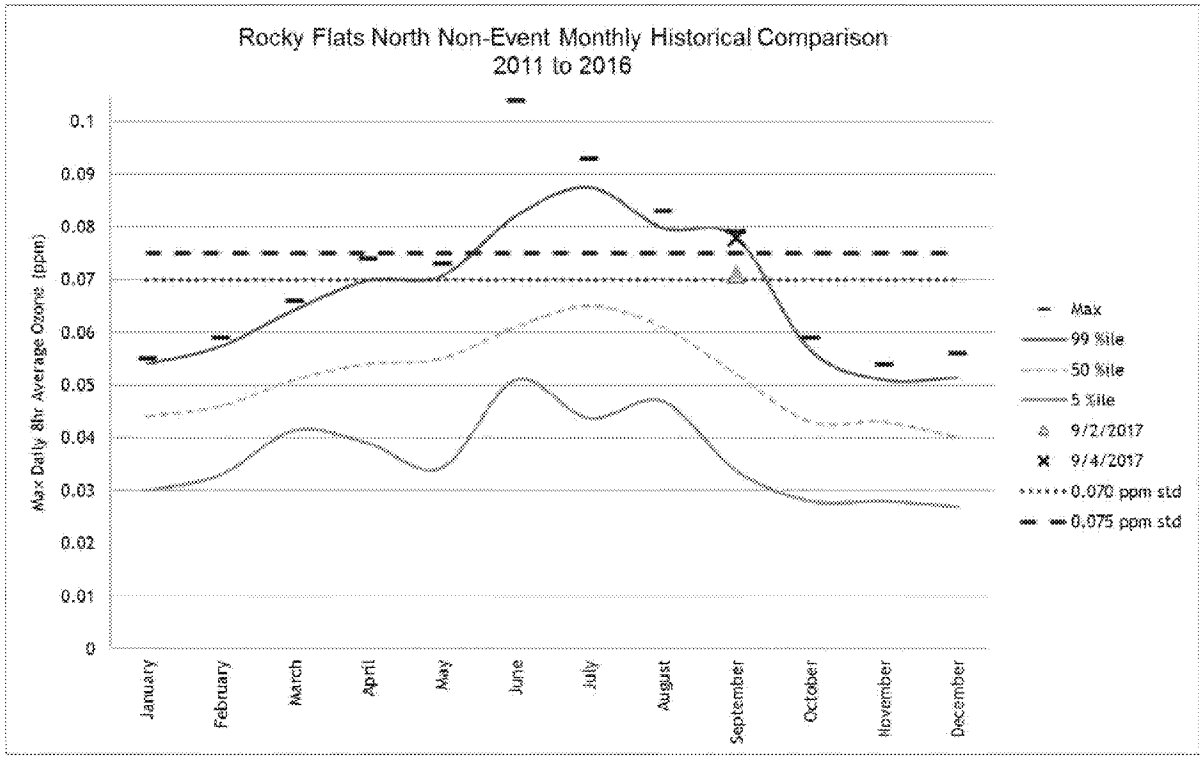


Figure 48: Monthly Non-Event Historical Comparison Plots for Highland (AQS ID 080050002) and NREL (AQS ID 080590011)



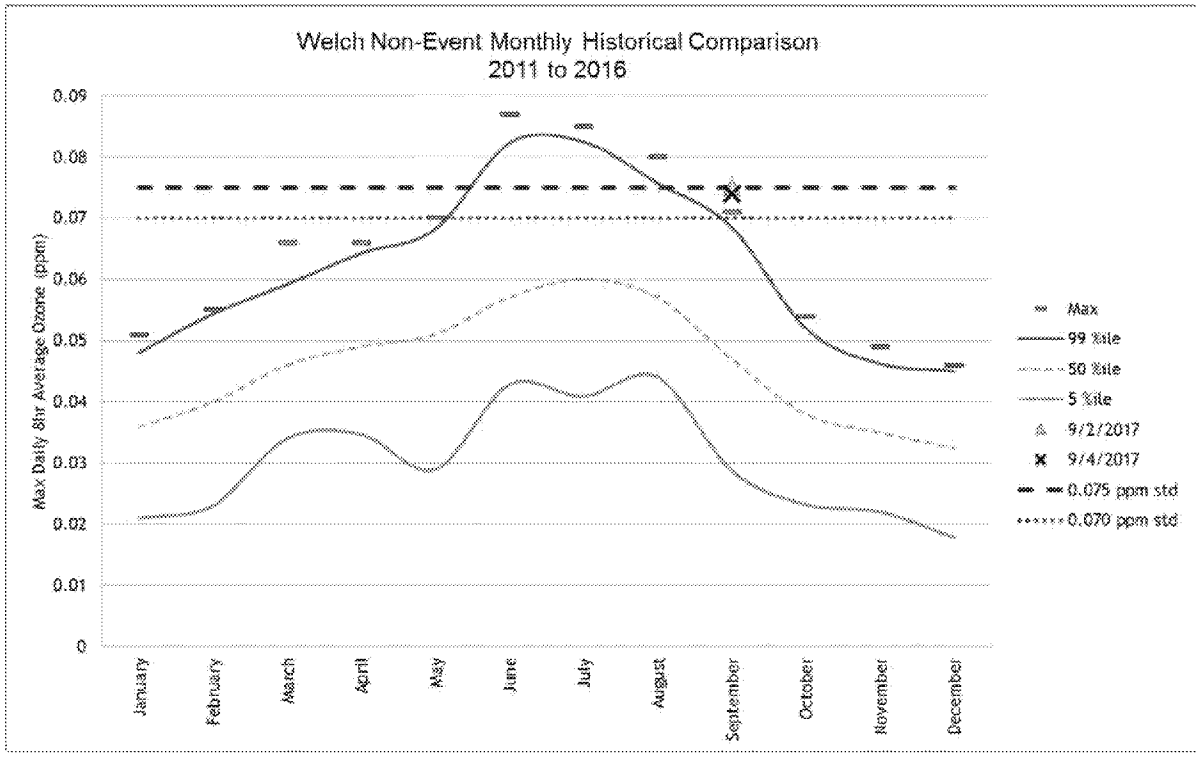
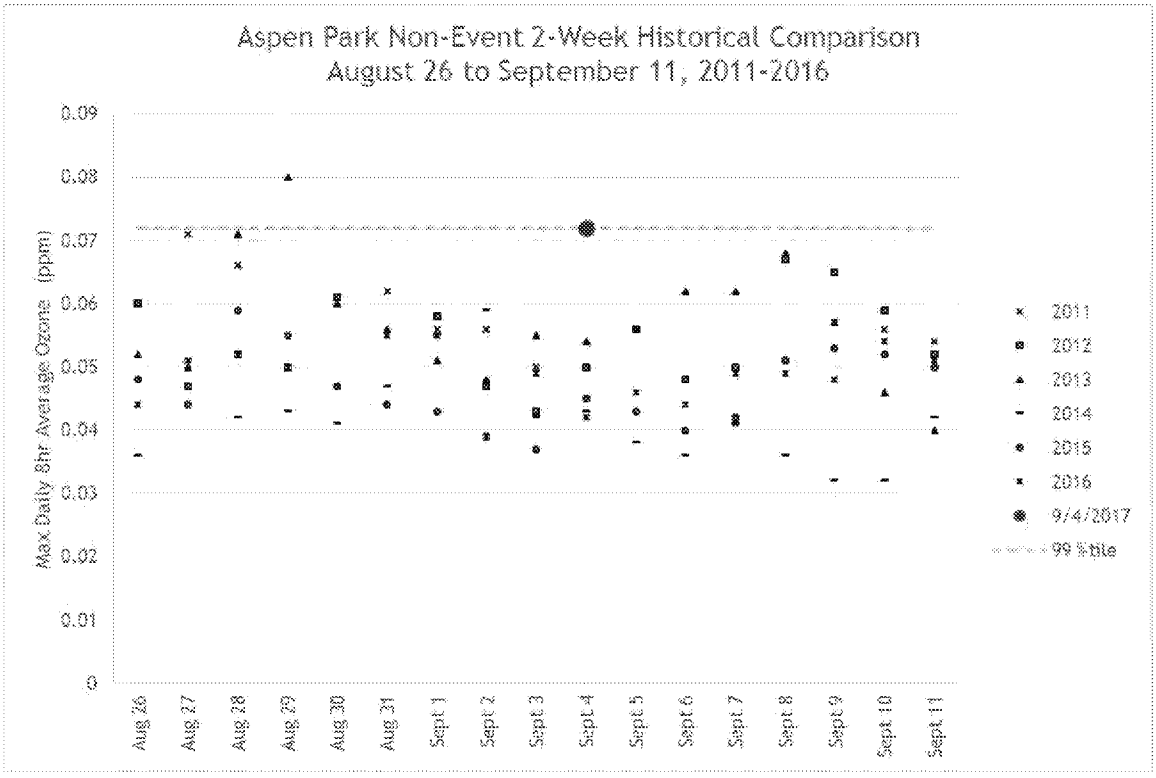


Figure 49: Monthly Non-Event Historical Comparison Plots for RFN (AQS ID 080590006) and Welch (AQS ID 080590005)



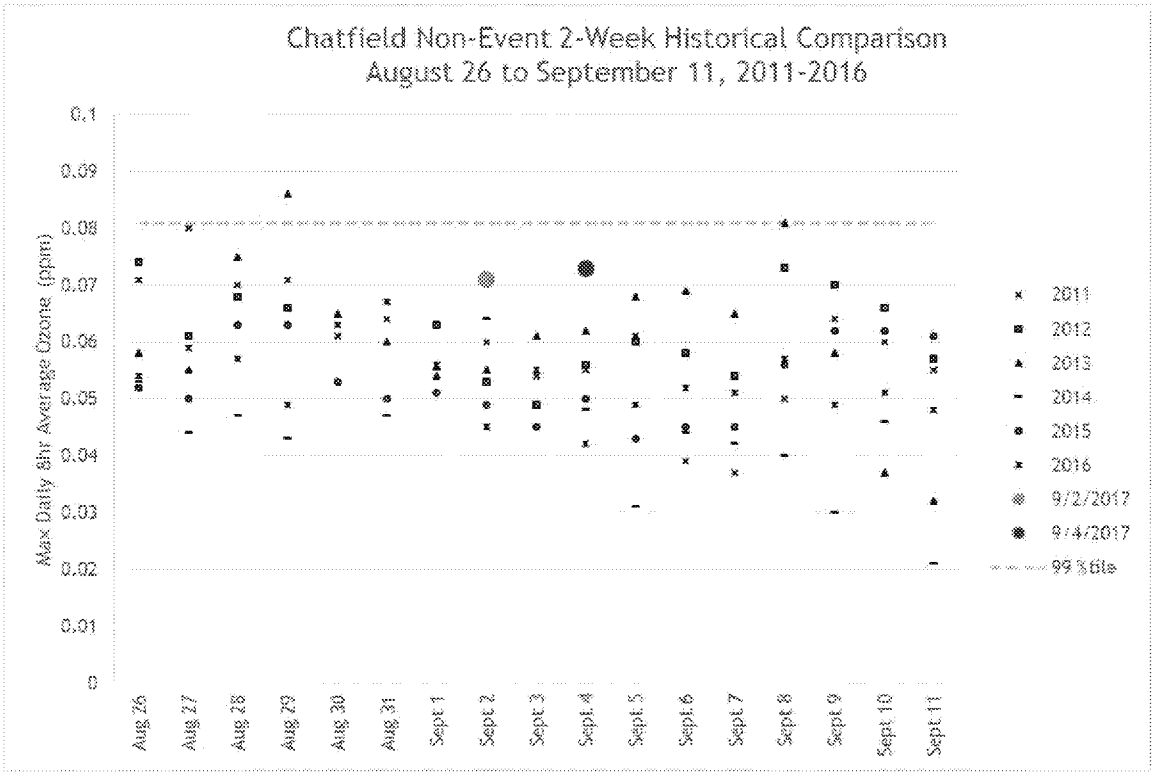
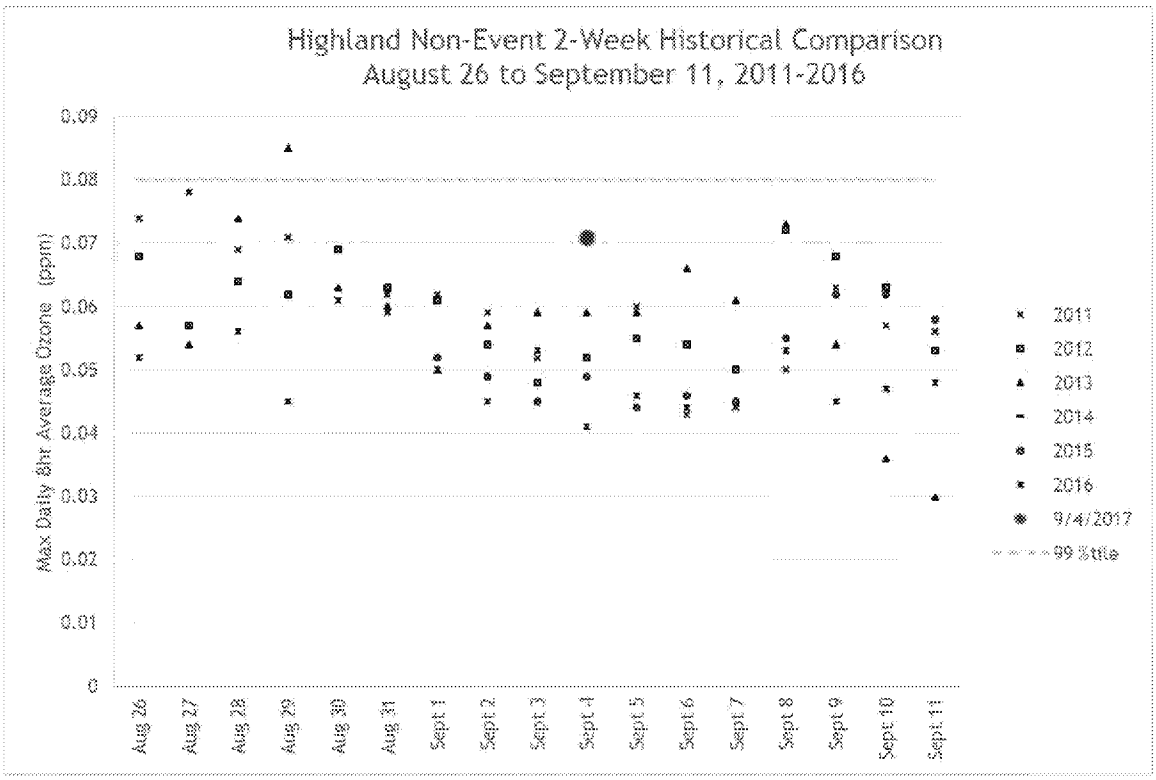


Figure 50: 2-Week Non-Event Historical Comparison Plots for Aspen Park (AQS ID 080590013) and Chatfield (AQS ID 080350004)



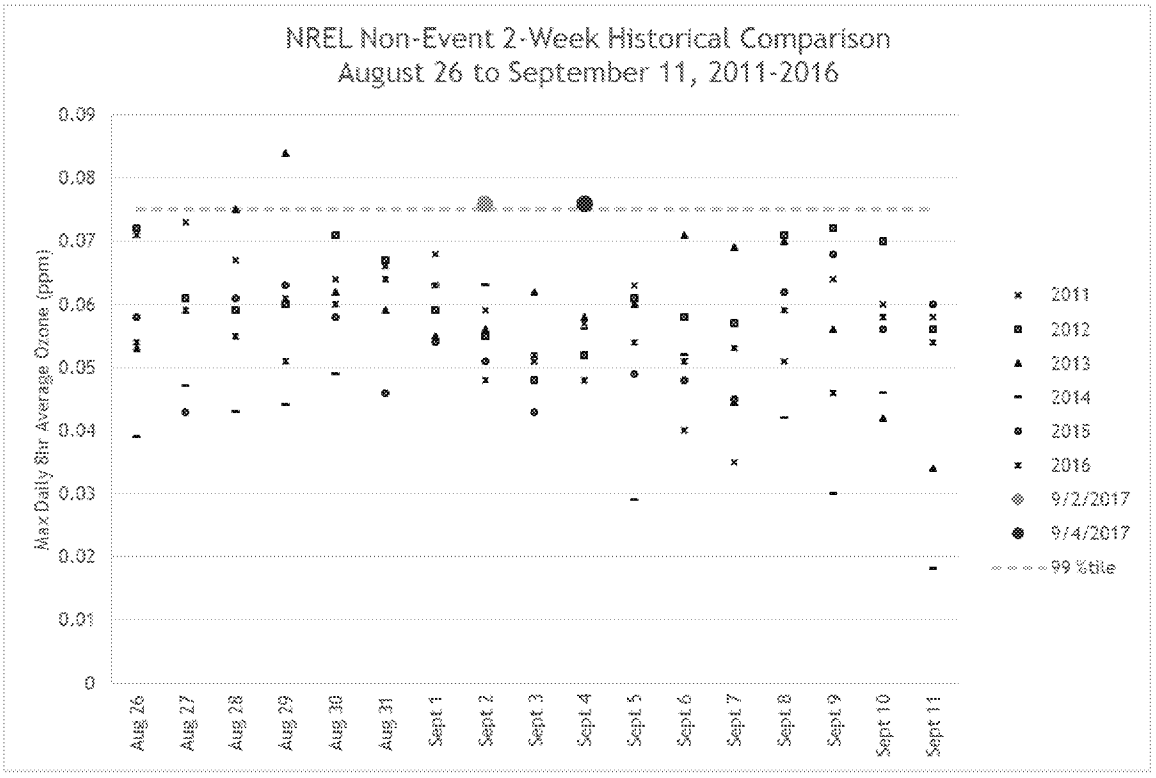
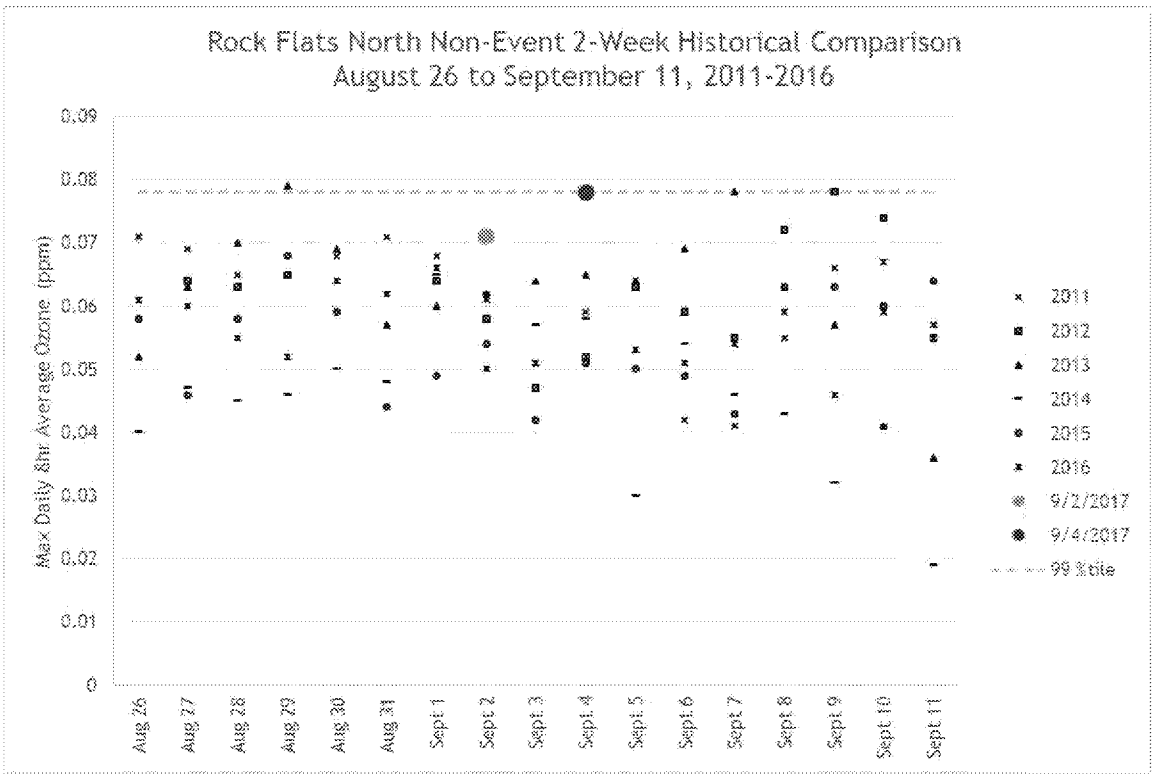


Figure 51: 2-Week Non-Event Historical Comparison Plots for Highland (AQS ID 080050002) and NREL (AQS ID 080590011)



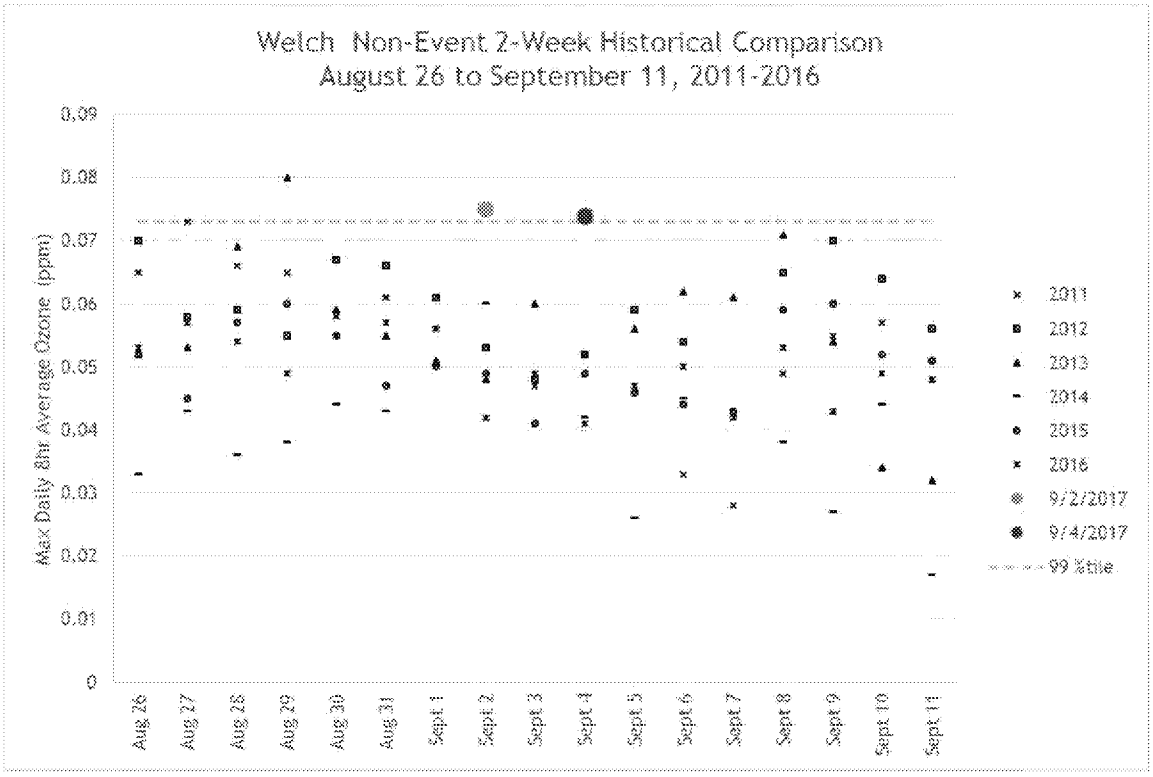


Figure 52: 2-Week Non-Event Historical Comparison Plots for RFN (AQS ID 080590006) and Welch (AQS ID 080590005)

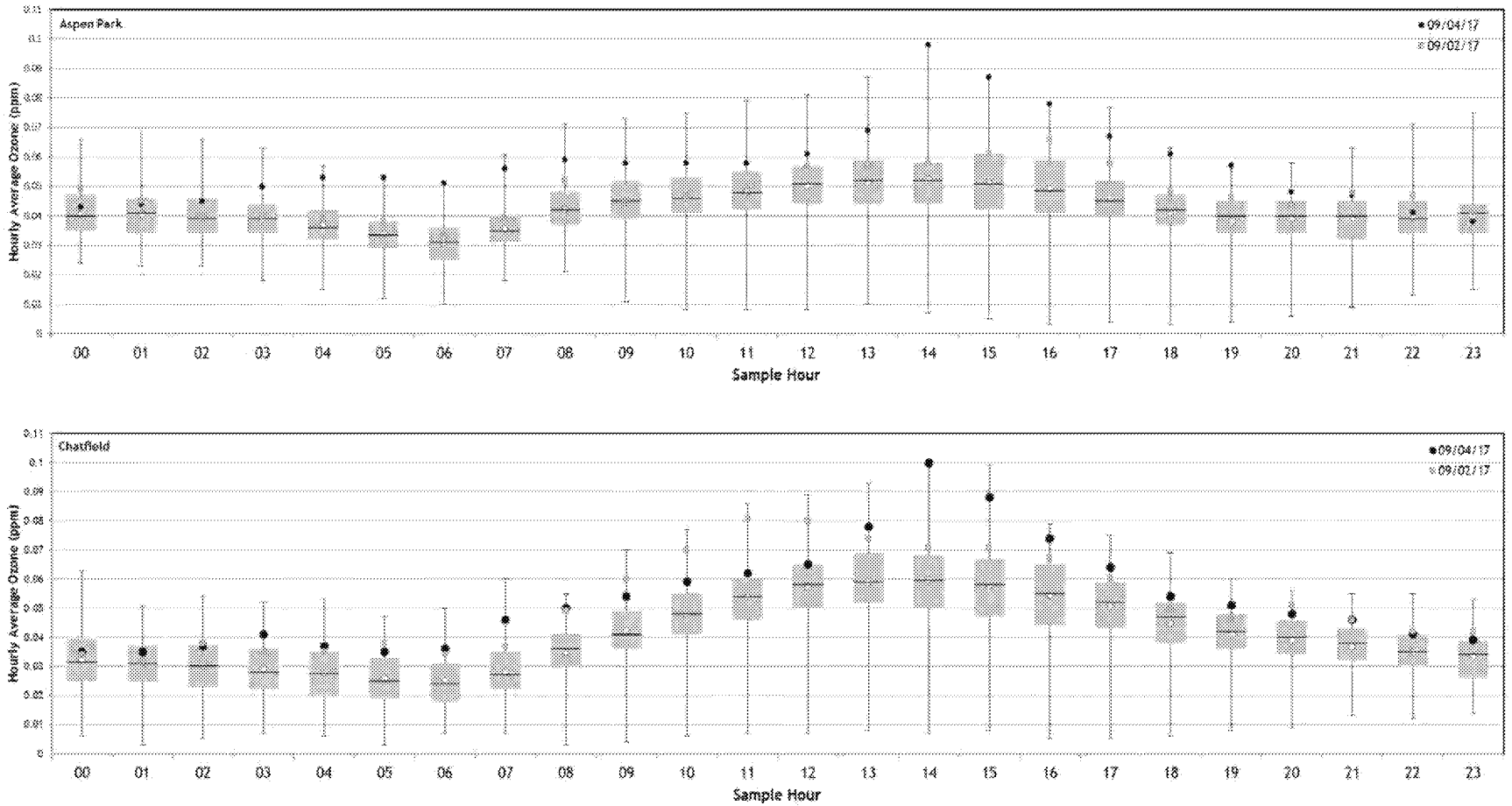


Figure 53: Diurnal Deviation from Normal Plots for hourly data at Aspen Park (AQS ID 080590013) and Chatfield (AQS ID 080350004)

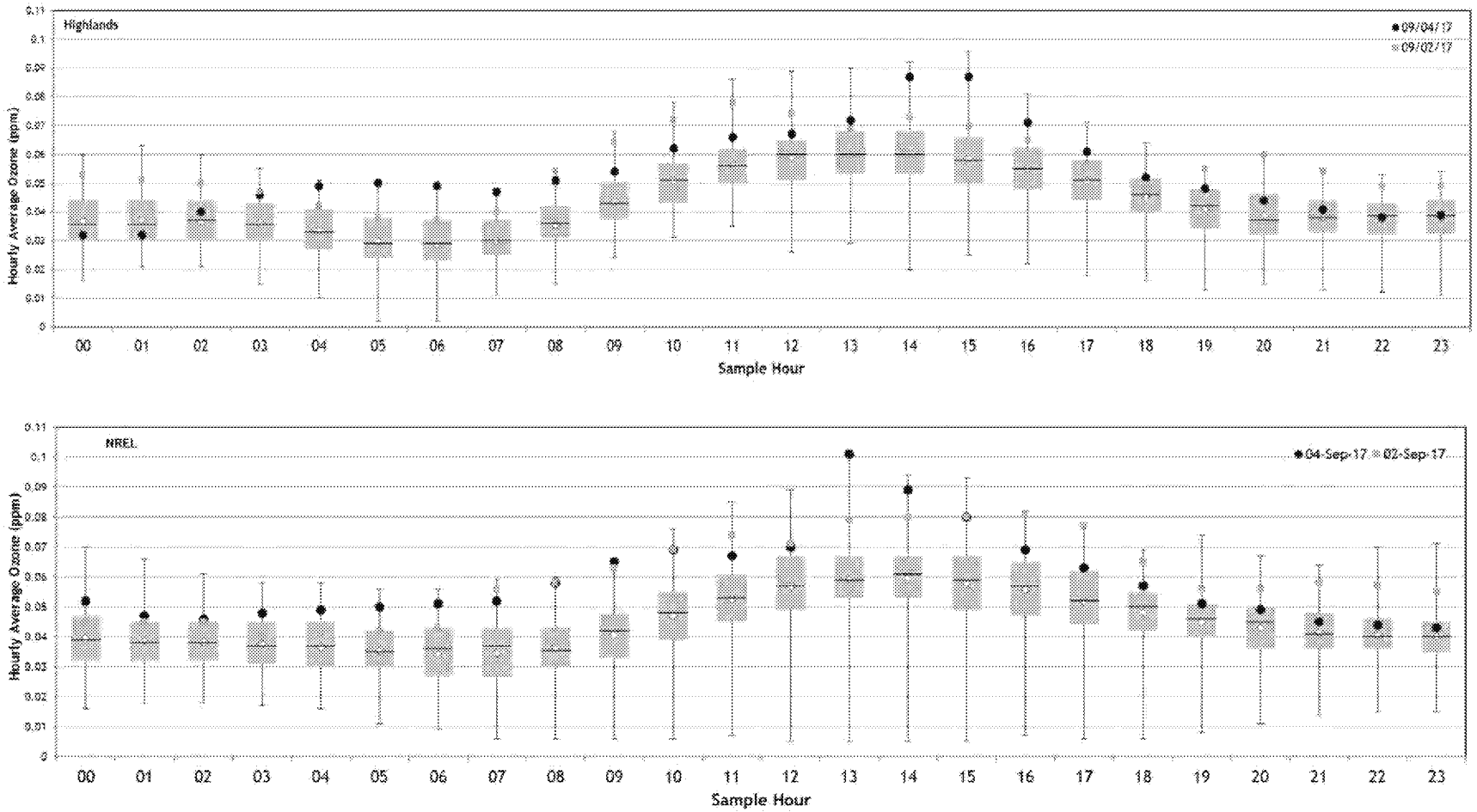


Figure 53: Diurnal Deviation from Normal Plots for hourly data at Highland (AQS ID 080050002) and NREL (AQS ID 080590011)

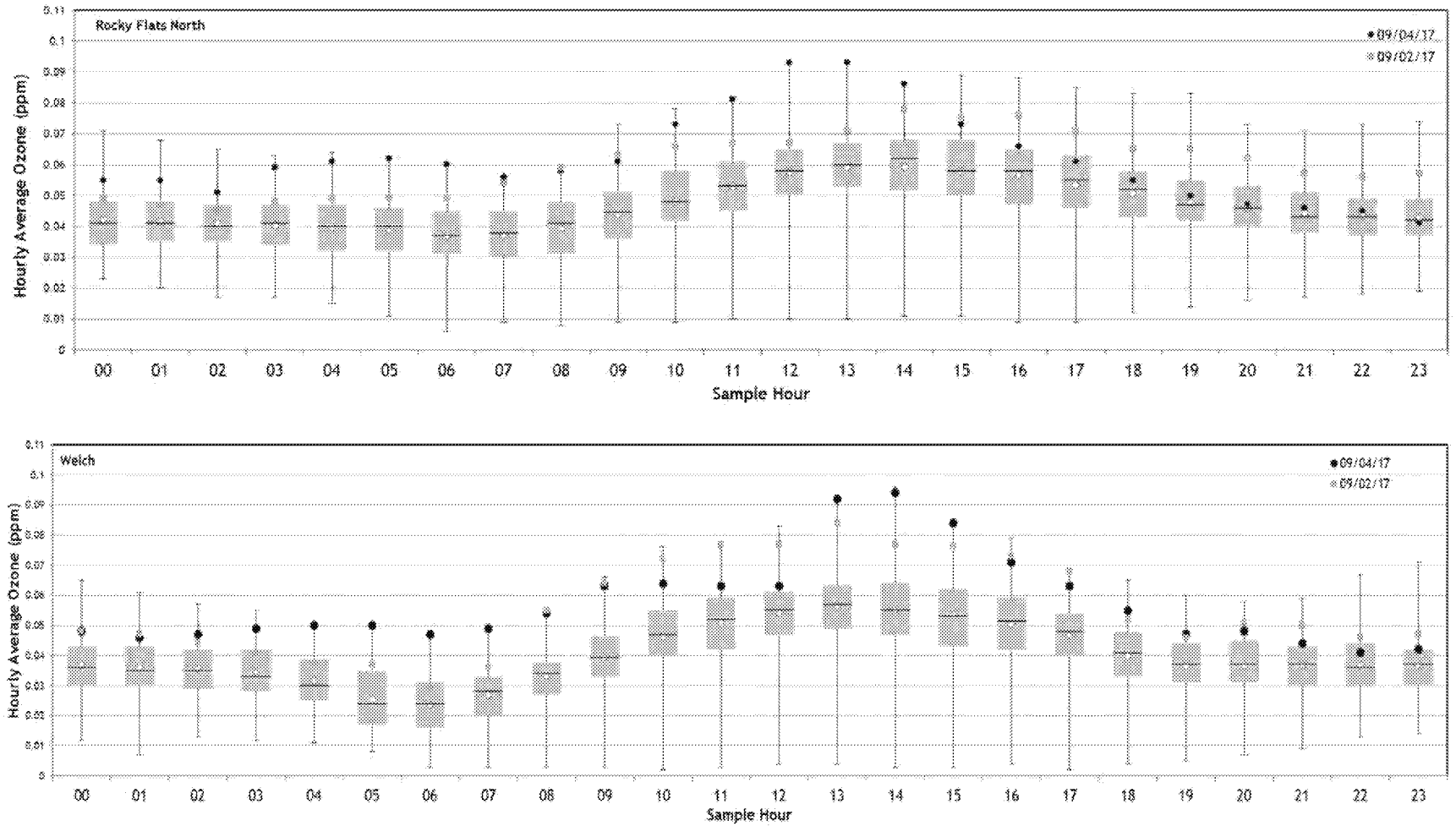


Figure 54: Diurnal Deviation from Normal Plots for hourly data at RFN (AQS ID 080590006) and Welch (AQS ID 080590005)

4.2.4 Historical Fluctuations of $PM_{2.5}$ Concentrations in the DM/NFR Area

To demonstrate the $PM_{2.5}$ data for this event was affected by an exceptional event, APCD compiled summary tables and charts of $PM_{2.5}$ Federal Reference Method (FRM) data from DM/NFR area samplers using five years of data from 2013 through 2017. Data have been taken from those sites which have continuously operated a FRM sampler for the entire period. The APCD has been monitoring $PM_{2.5}$ concentrations in these areas since 1999. The sample values for the event(s) are presented in Table 18. The overall data summary for the affected sites is presented in Table 19, with all data values presented in $\mu g/m^3$:

Table 18: FRM Sample Values September 2017

	ACC	Longmont	Boulder	CAMP	La Casa	Chatfield	Platteville
9/2/2017	n/a	n/a	n/a	24	n/a	n/a	n/a
9/4/2017	37.5	54.8	48.8	44.9	44.1	38.9	52.4

Table 19: 2013 - 2017 FRM Data Summary, Affected Sites

	ACC	Longmont	Boulder	CAMP	La Casa	Chatfield	Platteville
Average	6.1	6.9	5.7	7.2	7.2	5.3	7.6
Median	5.1	5.6	4.8	6.2	6.05	4.6	6.3
StDev.	4.0	5.4	4.3	4.5	5.0	4.2	5.6
Range	36.2	54.1	48.1	45.8	44.3	44.2	51.8
Min	1.3	0.7	0.7	0.5	1	0.7	0.6
Max	37.5	54.8	48.8	46.3	45.3	44.9	52.4
Count	569	570	576	1675	574	560	533

A snapshot summary of data from all sites affected by the event(s) is presented in Table 20, along with the approximate percentile value that each data point represents for each site within their unique historical data sets, for the month of the event (every sample in any September), and for the year of the event. All percentile calculations presented in this section were made using the entire 2013 - 2017 dataset. The sample value from CAMP on September 2, 2017 of 24 $\mu g/m^3$ was the only FRM sample available on that day. That value is the 2nd highest sample in any September, and exceeds the 99th percentile for the entire data set. Percentile calculations for some DM/NFR area sites affected by the event are presented in Table 20.

Table 20: Site Percentile (All Affected Front Range Sites)

Evaluation	*ACC*	*Longmont*	*Boulder*	*CAMP*	*La Casa*	*Chatfield*	*Platteville*	*CAMP (9/2)*
9/4/2017	37.5	54.8	48.8	44.9	44.1	38.9	52.4	24
Overall	Max	Max	Max	99.8	99.8	99.8	Max	98.8
Any Sept.	Max	Max	Max	Max	Max	Max	Max	99
2017	Max	Max	Max	Max	Max	Max	Max	98.8

The samples from the DM/NFR sites are exceptional within their own datasets for any evaluation criteria. The overall magnitude and broad geographical extent of affected sites suggests that there was a common contribution to each sample from sources beyond that contributed by local sources.

In addition to the sites equipped with FRM samplers a number of sites with FEM continuous samplers were impacted over this interval. Figure 55 presents a time series of those continuous sites equipped with an FEM sampler for seven days prior to September 2 and seven days after September 4. Note the spikes on September 4 and the elevated values on September 2 from sites spanning the DM/NFR area, with discussions of three area sites below.

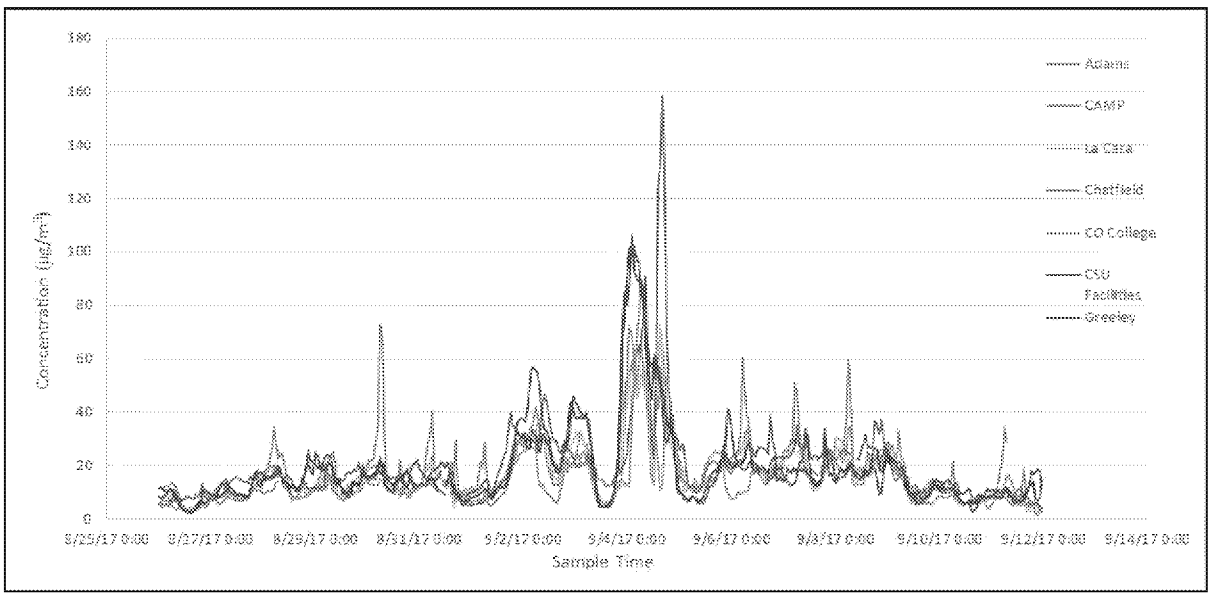


Figure 55: Front Range Hourly $PM_{2.5}$ Concentrations

Platteville - 081230008

The $PM_{2.5}$ sample on September 4, 2017, at Platteville of 52.4 µg/m^3 is the largest sample recorded among all September samples, is the maximum value for all 2017 data, and is the largest sample value for the entire dataset of 533 samples. The sample of September 4 clearly exceeds the typical values for this site.

The following graph characterizes the Platteville $PM_{2.5}$ data and demonstrates the extent to which the event sample is exceptional. Figure 56 is a box and whisker plot of all FRM samples from 2013 through 2017; the sample from September 4 is identified.

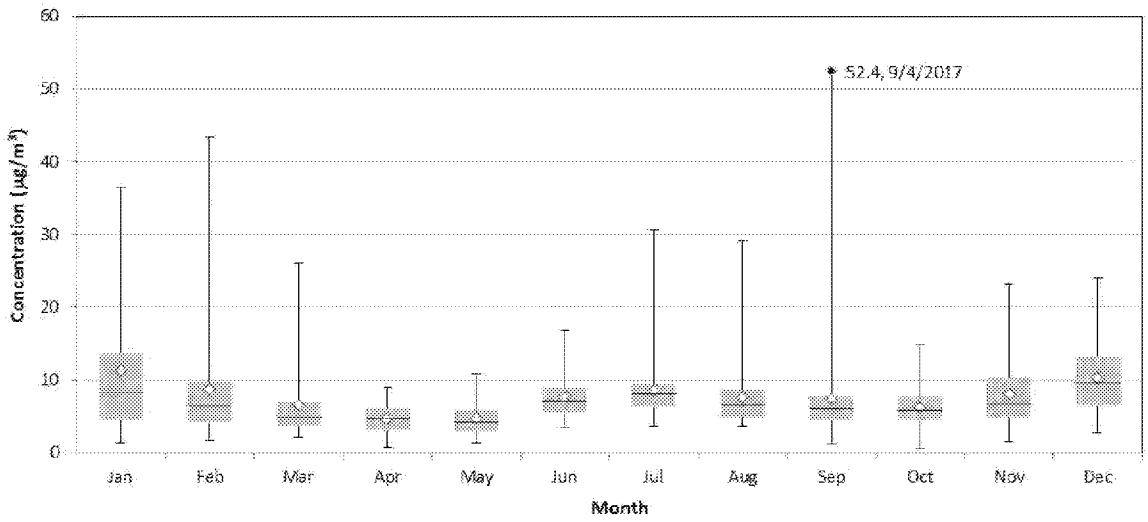


Figure 56: Platteville $PM_{2.5}$ Box and Whisker Plot

The monthly box-whisker plot highlights the typical seasonal variation of $PM_{2.5}$ samples at the Platteville monitoring site. Note the limited variability (narrower inter-quartile range) of the data through the summer and early fall months. Typically, samples from this time are low relative to those in the winter and early spring, taken during conditions typified by temperature inversions.

CAMP - 080310002

The $PM_{2.5}$ sample on September 4, 2017, at CAMP of 44.9 µg/m^3 is the largest sample recorded among all September samples, is the maximum value for all 2017 data, and exceeds 99% of all samples of the entire dataset of 1,675 samples. The sample of September 4 clearly exceeds the typical samples for this site. The sample of September 2, 2017 is the 2nd largest sample

recorded among all September samples, is the 4th largest from 2017, and exceeds 98% of the entire dataset. While not as extreme as the September 4 sample, it clearly exceeds what is typical for this site.

The following plot graphically characterizes the CAMP $PM_{2.5}$ data and demonstrates the extent to which the event sample is exceptional. Figure 57 is a box and whisker plot of all FRM samples from 2013 through 2017; the samples from September 2 and 4, 2017 are identified.

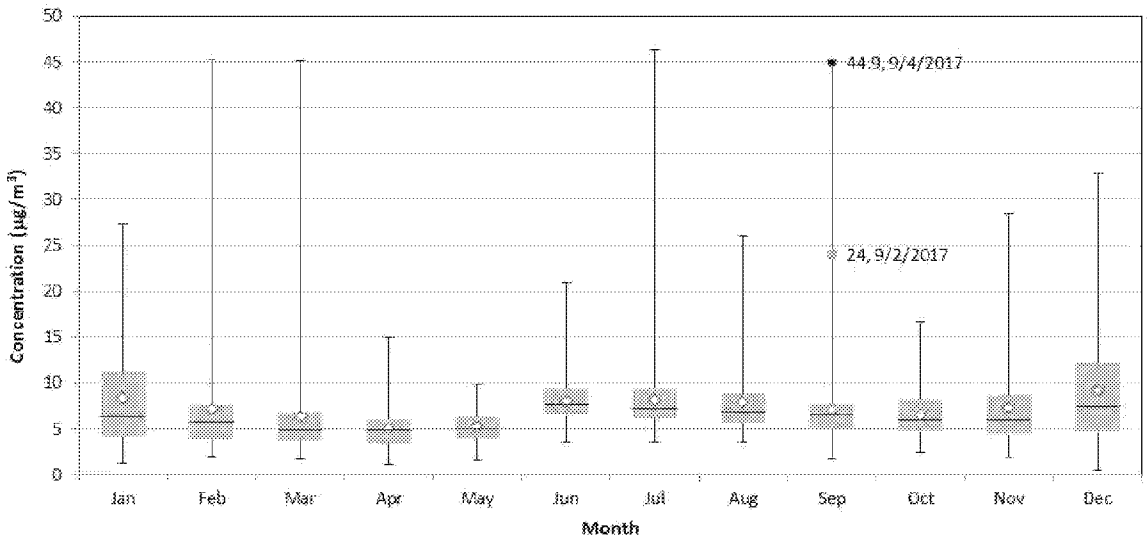


Figure 57: CAMP $PM_{2.5}$ Box and Whisker Plot

The monthly box-whisker plot highlights the typical seasonal variation of $PM_{2.5}$ samples at the CAMP monitoring site. Note the limited variability (narrower inter-quartile range) of the data through the summer and early fall months. Typically, samples from this time are low relative to those in the winter and early spring, taken during conditions typified by temperature inversions.

Chatfield - 080350004

The $PM_{2.5}$ sample on September 04, 2017, at Chatfield of 38.9 µg/m^3 is the largest sample recorded among all September samples, is the maximum value for all 2017 data, and exceeds 99% of all samples of the entire dataset of 560 samples. The sample of September clearly exceeds the typical samples for this site.

The following plot graphically characterizes the Chatfield $PM_{2.5}$ data and demonstrates the extent to which the event sample is exceptional. Figure 58 is a box and whisker plot of all FRM samples from 2013 through 2017; the samples from September 4, 2017 is identified.

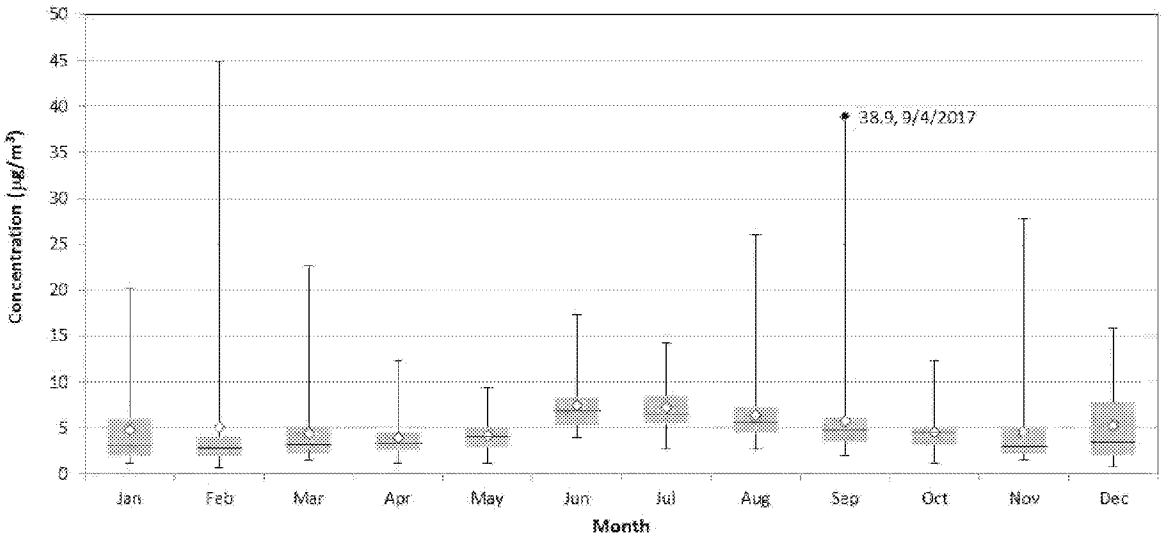


Figure 58: Chatfield $PM_{2.5}$ Box and Whisker Plot

The monthly box-whisker plot highlights the typical seasonal variation of $PM_{2.5}$ samples at the Chatfield monitoring site. Note the limited variability (narrower inner-quartile range) of the data through the summer and early fall months. Typically, samples from this time are low relative to those in the winter and early spring, taken during conditions typified by temperature inversions.

Historical Data Summary

Of the six monitors that the APCD is presenting as being influenced by a wildfire smoke exceptional event, on September 2, 2017:

- Three monitors met or exceeded the 99th percentile using six years of monthly September data from 2011-2016 [Chatfield (080350004), NREL (080590011), Welch (080590005)].
- Two monitors met or exceeded the 99th percentile using six years of 2-week data from August 26 to September 11 for years 2011 to 2016 [NREL (080590011), Welch (080590005)].

- Two monitors had event maximum daily 8-hour average rank order values in the top four positions using the previous one year of data from September 2, 2016 to September 4, 2017 [NREL (080590011), Welch (080590005)].
- Diurnal historical max hourly values were observed at Highland (080050002) (hours 19 to 21), NREL (080590011) (hours 16 and 17), RFN (080590006) (hour 8), and Welch (080590005) (hour 17) using data from August 26-September 11, 2013-2017.
- Elevated $PM_{2.5}$ values and aethalometer data from select sites in the DM/NFR area support visual and meteorological observations that wildfire smoke was in the area.

Of the six monitors that the APCD is presenting as being influenced by a wildfire smoke exceptional event, on September 4, 2017:

- Five monitors met or exceeded the 99th percentile using six years of monthly September data from 2011-2016 [Aspen Park (AQS ID 080590013), Chatfield (AQS ID 080350004), Highland (AQS ID 080050002), NREL (AQS ID 080590011), Welch (AQS ID 080590005)].
- Three monitors met or exceeded the 99th percentile using six years of 2-week data from August 26 to September 11 for years 2011 to 2016 [Aspen Park (AQS ID 080590013), NREL (AQS ID 080590011), Welch (AQS ID 080590005)].
- Three monitors had event maximum daily 8-hour average rank order values in the top four positions using the previous one year of data from September 2, 2016 to September 4, 2017 [Aspen Park (AQS ID 080590013), NREL (AQS ID 080590011), RFN (AQS ID 08059006)].
- Diurnal historical max hourly values were observed at Aspen Park (080590013) (hours 5,6,14,15,16, and 19), Chatfield (AQS ID 080350004) (hour 14), Highland (AQS ID 080050002) (hours 5,6, and 7), NREL (AQS ID 080590011) (hour 9 and 13), RFN (AQS ID 080590006) (hours 5, 6, 7, 12, 13, and 14 hrs) and Welch (AQS ID 080590005) (hours 4,5,6,7,13, and 15) using data from August 26 to September 11, 2013-2017.
- Elevated $PM_{2.5}$ values and aethalometer data from select sites in the DM/NFR area support visual and meteorological observations that wildfire smoke was in the area.

These events, when taken in their entirety and as summarized above, meet the criteria for key factor #2 as described in the Guidance and thus support this demonstration. The uncharacteristically high hourly and maximum daily 8-hour average O_3 concentrations, particularly in the presence of high $PM_{2.5}$ concentrations, and the exceptional spatial

coverage of the event over the DM/NFR area, all suggest that the six monitors presented in this analysis were influenced by a wildfire smoke exceptional event and should be excluded from consideration in O_3 NAAQS determinations.

ED_002666_00009483-00116

5.0 Caused by Human Activity that is Unlikely to Recur at a Particular Location of a Natural Event

According to the CAA and the EER, an exceptional event must be "an event caused by human activity that is unlikely to recur at a particular location *or* a natural event" The definition of wildfire in the EER is: "…is any fire started by an unplanned ignition caused by lightning; volcanoes; other acts of nature; unauthorized activity; or accidental, human-caused actions, or a prescribed fire that has developed into a wildfire. A wildfire that predominantly occurs on wildland is a natural event."

Per 40 CFR 50.1(o), natural factors are principally responsible for wildfires on wildland (defined as "an area in which development is essentially non-existent, except for roads, railroads, powerlines, and similar transportation facilities. Structures, if any, are widely scattered."). Land within national parks, national forests, wilderness areas, state forests, state parks, and state wilderness areas are generally considered wildland. Land outside cantonment areas on military bases may also be considered wildland. Therefore, the EPA believes that treating all wildfires on wildland as natural events is consistent with the CAA and the EER. Since wildfires on wildland are treated as natural events, it is expected that minimal documentation will be required to meet the human activity that is unlikely to recur at a particular location or a natural event element.

Based on the documentation provided in Section 4 and Appendix C of this submittal, of the twenty-eight wildfires discussed in this petition, twenty-four were caused by lightning or a natural cause and four have an unknown cause, while all of the wildfires occurred on wildland.

The EPA generally considers the emissions of O_3 precursors from wildfires on wildland to meet the regulatory definition of a natural event at 40 CFR 50.1(k). The APCD has shown that the wildfire events occurred on wildland, qualify as natural events, and may be considered for treatment as an exceptional event.

ED_002666_00009483-00117

6.0 Not Reasonably Controllable or Preventable

According to the CAA and the EER, an exceptional event must be "not reasonably controllable or preventable." The preamble to the EER clarifies that the EPA interprets this requirement to contain two factors: the event must be both not reasonably controllable and not reasonably preventable at the time the event occurred. This 14 40 CFR 50.1(o). 32 requirement applies to both natural events and events caused by human activities, however it is presumptively assumed that wildfires on wildland will satisfy both factors of the "not reasonably controllable or preventable" element unless evidence in the record clearly demonstrates otherwise.

Based on the documentation provided in Section 4.0 and Appendix C of this submittal, of the twenty-eight wildfires discussed in this in this petition, twenty-four were caused by lighting or a natural cause, four have an unknown cause, and all of the wildfires occurred on wildland. The APCD is not aware of any evidence clearly demonstrating that prevention or control efforts beyond those actually made would have been reasonable. Therefore, emissions from these wildfires were not reasonably controllable or preventable.

ED_002666_00009483-00118

7.0 Public Comment

According to the provisions in 40 CFR 50.14(c)(1)(i), air agencies must "notify the public promptly whenever an event occurs or is reasonably anticipated to occur which may result in the exceedance of an applicable air quality standard." Appendix D provides the APCD Air Quality Advisories that were issued in advance of these two events. The Advisories were posted on the APCD website and social media accounts, and distributed to the APCD air quality email lists which include media outlets, public health agencies and the general public. The Air Quality Health Advisory for Wildfire Smoke issued on September 4, 2017 was also forwarded to an extended list of county level public health and environmental contacts in the affected counties.

In addition, according to 40 CFR 50.14(c)(3)(v), air agencies must "document [in their exceptional events demonstration] that the [air agency] followed the public comment process and that the comment period was open for a minimum of 30 days…." Further, air agencies must submit any received public comments to the EPA and address in their submission those comments disputing or contradicting the factual evidence in the demonstration.

The APCD posted notice of this exceptional event demonstration on April 6, 2018 on the APCD website at: https://www.colorado.gov/pacific/cdphe/air-division-public-comment and https://www.colorado.gov/airquality/tech_doc_repository.aspx. Notice of the public comment period was also emailed to the Colorado Air Quality Control Commission, the Regional Air Quality Control Council, and APCD's permit email lists. Comments were accepted until 5:00 p.m. on May 16, 2018, which was a requested extension from the original May 9, 2018 date. Seven comments were received. Appendix E contains the web posting, email notice, public comments that were received, and APCD's responses to these comments.

ED_002666_00009483-00119

8.0 Conclusion

Numerous wildfires in the Pacific Northwest, Wyoming, Idaho and Montana generated high levels of O_3 precursors and O_3 concentrations that were transported into Colorado's DM/NFR area on prevailing winds. The wildfire emissions resulted in elevated concentrations at four O_3 monitoring sites on September 2, 2017 and six O_3 monitoring sites on September 4, 2017 in Colorado. These resulted in three exceedances of the 2008 0.075 ppm NAAQS and ten exceedances of the 2015 0.070 ppm NAAQS. The evidence presented in this document satisfies the exceptional event criteria: the event was a natural event, which affected air quality in such a way that there exists a clear causal relationship between the event and monitored exceedances, and was not reasonable controllable or preventable. APCD has also satisfied the procedural requirements for data exclusion. The APCD requests that EPA Region 8 concur with this exceptional event demonstration and exclude the O_3 monitoring data listed in Table 21.

Table 21: Daily Maximum 8-hour O_3 Concentrations for the Exceptional Event

Site Name AQSID	Aspen Park 08-059-0013	Chatfield 08-035-0004	Highland 08-005-0002	NREL 08-059-0011	RFN 08-059-0006	Welch 08-059-0005
9/2/2017	--- *	**0.071 ppm**	--- *	**0.076 ppm**	**0.071 ppm**	**0.075 ppm**
9/4/2017	**0.072 ppm**	**0.073 ppm**	**0.071 ppm**	**0.076 ppm**	**0.078 ppm**	**0.074 ppm**
Affected hours to be excluded:						
9/2/2017	--- *	9 - 17	--- *	8 - 20	10 - 19	8 - 18
9/4/2017	10 - 19	9 - 19	10 - 17	7 - 19	6 - 19	8 - 19

* Not requested for event concurrence

ED_002666_00009483-00120

9.0 References

United States Environmental Protection Agency, 2016. Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations, Final. [Available online at: https://www.epa.gov/sites/production/files/2016-09/documents/exceptional_events_guidance_9-16-16_final.pdf]

Air Pollution Control Division, and Regional Air Quality Council, 2017. Moderate Area O_3 SIP for the Denver Metro and North Front Range Nonattainment Area. [Available online at: https://raqc.egnyte.com/dl/uJJfKleU67/FinalModerateOzoneSIP_2016-11-29.pdf_]

Kansas Department of Health and Environment, 2012. State of Kansas Exceptional Event Demonstration Package April 6, 12, 13, and 29, 2011. [Available at: https://www.epa.gov/sites/production/files/2015-05/documents/kdhe_exevents_final_042011.pdf]

California Air Resources Board, 2011. Exceptional Events Demonstration for 1-Hour Ozone Exceedances in the Sacramento Regional Nonattainment Are Due to 2008 Wildfires. [Available at: https://www.epa.gov/sites/production/files/2015-05/carb_demonstration_33011.zip]

Connecticut Department of Energy and Environmental Protection, 2017. May 2016 Ozone Exceptional Event Analysis Technical Support Document. [Available at: https://www.epa.gov/sites/production/files/2017-09/documents/r1_ct_deep_ft._mcmurray_final_demonstration_submittal_20170523.pdf}]

Massachusetts Department of Environmental Protection, 2017. Massachusetts Exceptional Events Demonstration May 2016 Fort McMurray Wildfire. [Available at: https://www.epa.gov/sites/production/files/2017-09/documents/r1_ct_deep_ft._mcmurray_final_demonstration_submittal_20170523.pdf]

State of New Jersey Department of Environmental Protection, 2017. Exceptional Event Demonstration Analysis for Ozone during May 25-26, 2016. [Available at: https://www.epa.gov/sites/production/files/2017-12/documents/final_ee_for_nj.pdf]

Rhode Island Department of Environmental Management, 2017. Exceptional Event Demonstration Fort McMurray Wildfire May 25th and 26th 2016. [Available at: https://www.epa.gov/sites/production/files/2017-10/documents/ri_dem_ft._mcmurray_exceptional_event_demo_6-20-2017.pdf]

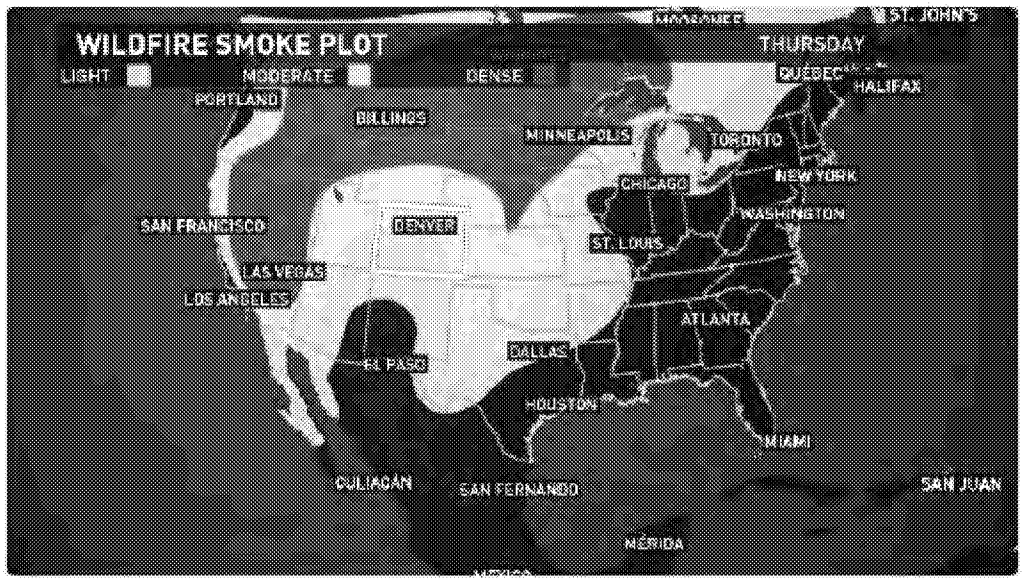
Zhang K.M., et al., 2017. Joint measurements of $PM_{2.5}$ and light-absorptive PM in woodsmoke-dominated ambient and plume environments. Atmospheric Chemistry and Physics. V17, 11441-11452.

Reddy P.J., and Pfister, G.G., 2016. Meteorological factors contributing to the interannual variability of midsummer surface ozone in Colorado, Utah, and other western US states. Journal of Geophysical Research: Atmospheres 121 (5), 2434-2456.

Appendix A: Media Coverage and Social Media Posts

Marty Coniglio @martyconiglio · Aug 31

Hazy/smoke from western wildfires still hanging over Colorado. #9WK #9news #cowx #9newsmornings



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Cory Reppenhagen liked

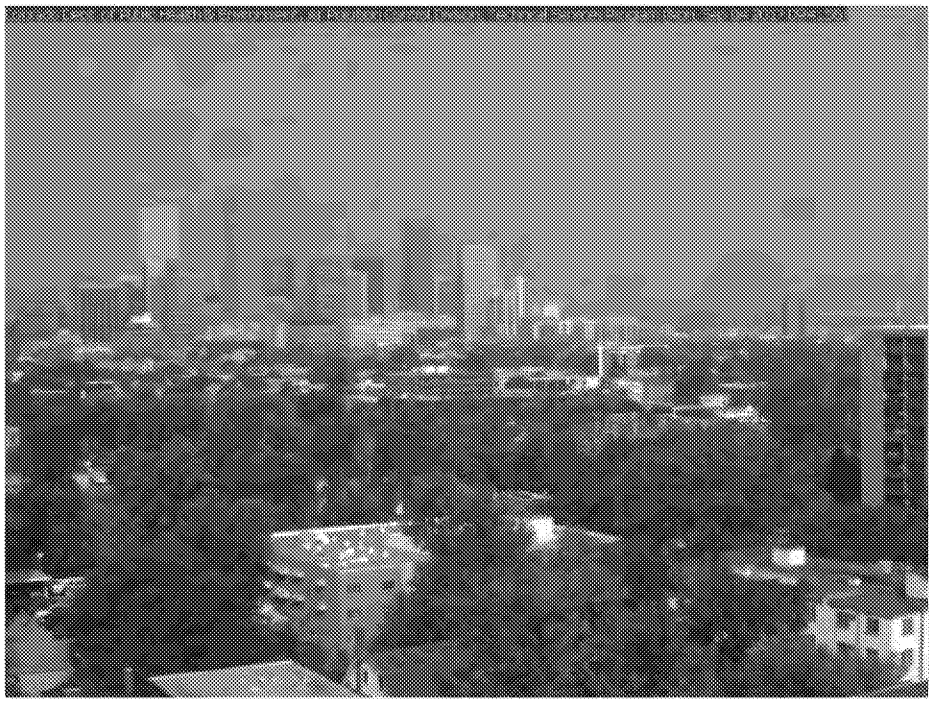
Tony's Takes @TonysTakes · Sep 3

A gorgeous #sunrise this AM on top Mount Evans, #Colorado. Unfortunately a lot of the color is due to **smoke** from #wildfire in MT & OR. #cowx

3 10

CDPHE Air Pollution @cdpheapcd · Sep 4

Air Quality Health Advisory for **Wildfire Smoke**: all of eastern **Colorado** below 7000 ft. Denver skyline. #cofire bit.ly/2sYINPx



12 5

Social In Denver and 3 others follow

H @heatherswan · Sep 4

#wildfire #smoke #denver **#colorado** #sunset

1 2

Marty Coniglio @martyconiglio · Sep 4

HORRIBLE visibility today from Lookout Mtn due to Montana wildfire smoke.
#9WX #9news #9newsmornings #cowx

3 19 15

Marty Coniglio @martyconiglio · Sep 4

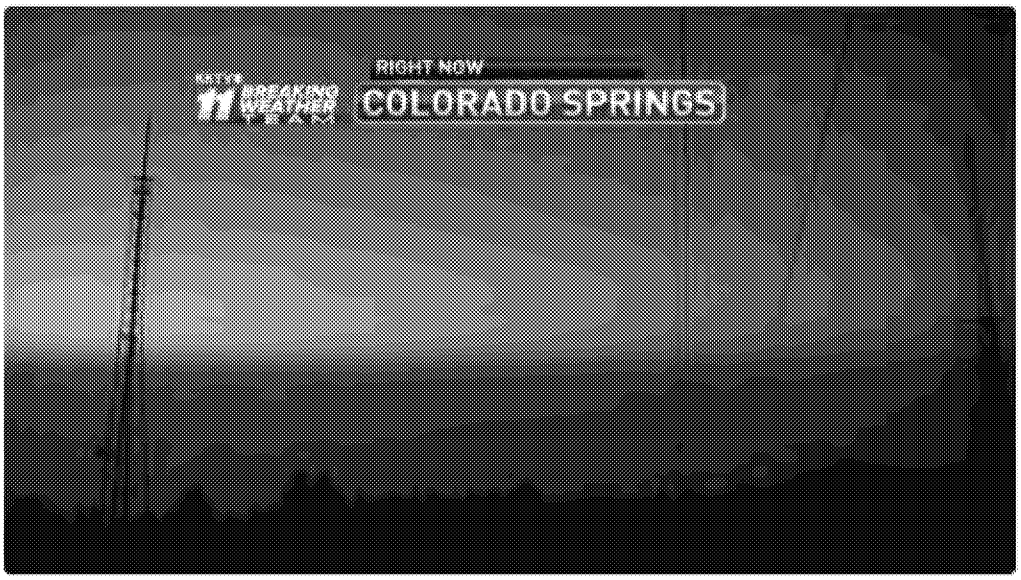
Thick, thick wildfire smoke in Greeley and over the Front Range this morning.
#9WX #9news #9newsmornings #cowx

1 1 2

The Gazette Retweeted

KKTV11Weather @KKTV11Weather · Sep 4

We have hazy skies over **Colorado** Springs due to trapped **wildfire smoke** from Oregon & California #cowx



4 3

KOAA 5

September 5 ·

Like Page

Expect another hazy day! We are under an Air Quality Health Advisory for most of the day Tuesday, because of smoke blowing into Colorado from Montana and other fires in the western U.S.

Air quality health advisory issued for wildfire smoke

The Colorado Department of Public Health and Environment has issued an Air Quality Health Advisory because of wildfire smoke.

KOAA.COM

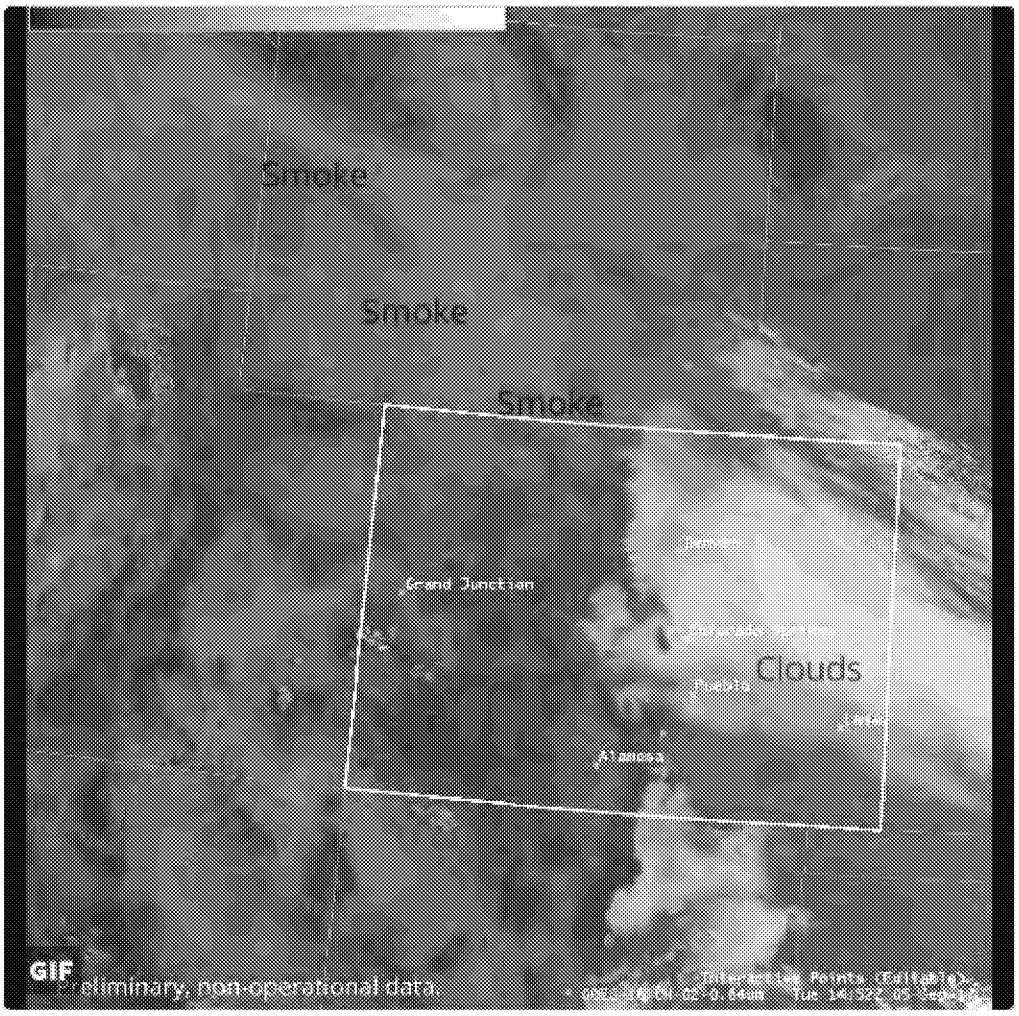
135

14 Comments 102 Shares

Like Comment Share

NWS Pueblo @NWSPueblo · Sep 5

#GOES16 visible imagery shows clouds slowly dissipating across southern **Colorado** as **wildfire smoke** continues to stream into the state. #cowx



4 1

Christian Herrmann @cqherrmann · Sep 5

#wildfire #smoke sunset in #FortCollins, **#Colorado**. @coloradoan @denverpost @nytimes

1 1

Libbys on the Loose @libbysonloose · Sep 5

The upper atmospheric winds have brought **wildfire smoke** to **Colorado** from the Pacific Northwest. Fortunately, it doesn't smell smoky, so th...

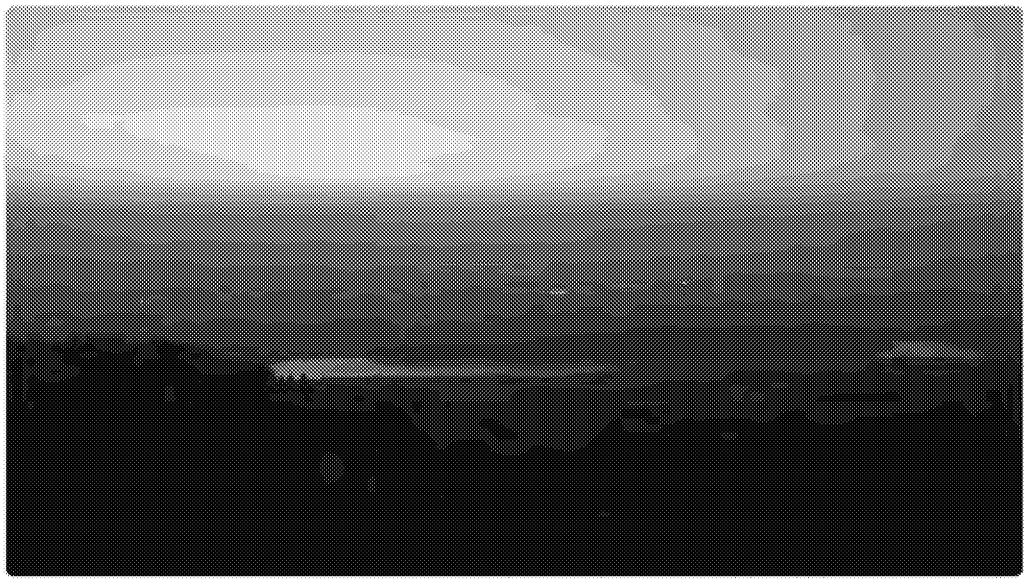
Christian Herrmann @cqherrmann · Sep 5

#wildfire #smoke skies in #FortCollins, **#Colorado**. @coloradoan @denverpost @nytimes

1

Marty Coniglio @martyconiglio · Sep 6

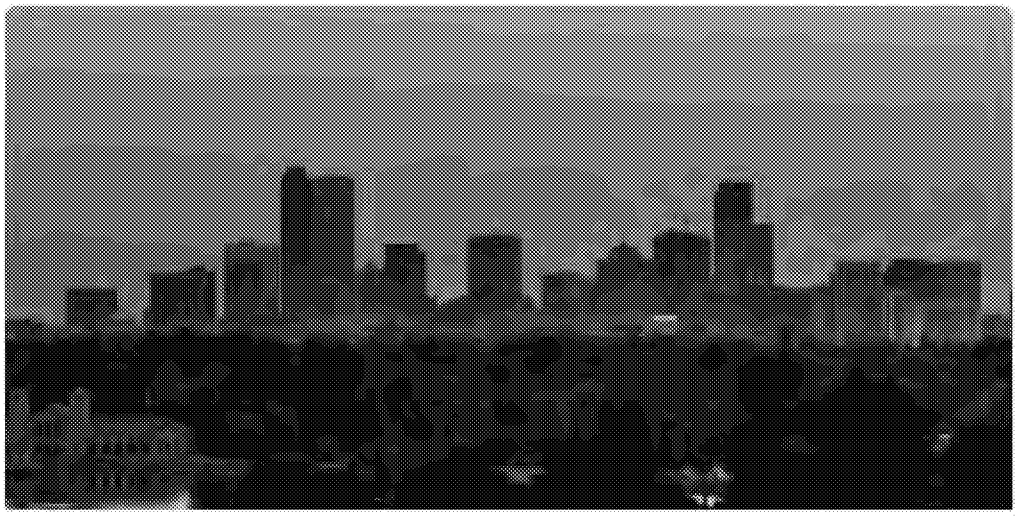
Smoke, haze, dust in the sky again today. #9WX #9news #9newsmornings #cowx



1 6 5

Denver News @denvernews · Sep 6

Wildfire smoke will continue to foul **Colorado**'s air quality until at least Thursday



Wildfire smoke will continue to foul Colorado's air quality until at l...

The thick smoke from local and out-of-state wildfires will continue to obscure the Front Range and foul Colorado's air quality until at least Thu...

denverpost.com

1 5

CO Parks & Wildlife and 1 other follow

CO Geological Survey @COGeolSurvey · Sep 7

Western **#wildfire #smoke** continues to hang heavy over Golden and the rest of **Colorado...**

1

NEWS WEATHER

Wildfire smoke with a chance of rain and thunder Friday in Denver

Joe Amon, The Denver Post

Haze over downtown Denver on Sept. 6, 2017.

By KIRK MITCHELL | kmitchell@denverpost.com | The Denver Post
September 8, 2017 at 6:00 am

Smoke from western and northwest Colorado wildfires will cast a darker tint to an otherwise sunny day along the Front Range Friday before late afternoon clouds roll into the area, according to forecasters.

"There will still be areas of smoke and haze over the region again today, especially over the mountains and nearby plains," the National Weather Service in Boulder said in a cautionary note.

The elderly, young and people with respiratory conditions are advised to limit outdoor exposure.

There's a 20 percent chance of late afternoon and evening thunderstorms and rain. "Expect mainly brief rain and gusty winds with the showers," the weather service says. The temperature is expected to rise to around 87 degrees.

It will be a very warm weekend with temperatures right around 90 degrees Saturday and Sunday. On Sunday there is a 20 percent chance of afternoon rain.

It will be mostly sunny with a high of 86 degrees on Monday.

There's a slight chance each afternoon Tuesday through Thursday of next week, the NWS says.

DENVER WEATHER

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Denver's current weather

It's mostly cloudy in Denver.
In the last 24 hours the high temperature was 88°, and the low was 58°.

58°

Cloud cover: 75%
Precipitation in the past 24 hours: 0.04"

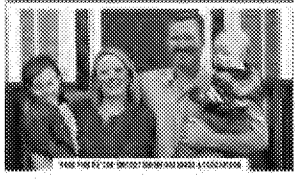
» COLORADO WEATHER NEWS

PAID ADVERTISEMENT

COMMON-SENSE REGULATION

THESE DAYS, NOT MUCH IN WASHINGTON DC SEEMS TO WORK FOR US

EXCEPT OUR SENATOR, MICHAEL BENNET.



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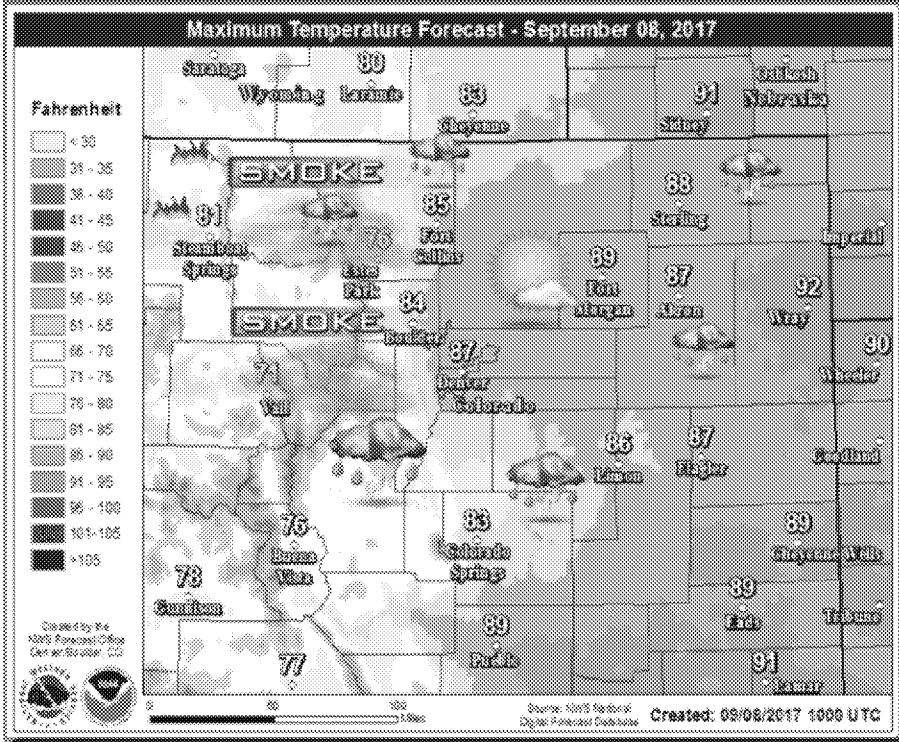
(source: http://www.denverpost.com/2017/09/08/denver-weather-wildfire-smoke-friday/)

SMOKE SMOKE

Better chance for storms in Mountains



Today

- Partly sunny
- Smoky/Hazy skies
- Chance of thunderstorms, mainly in the mountains.

Outlook

- Chance for storms this weekend, mainly mountains.

9/8/2017 4:57 AM

National Weather Service – Denver/Boulder, Colorado

Published on: 09/08/2017 at 5:05AM

Appendix B: NWS Forecast Discussion and NOAA Narrative for Smoke/Dust Observed in Satellite Imagery

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007
FXUS65 KBOU 020857
AFDBOU

Area Forecast Discussion
National Weather Service Denver/Boulder CO
257 AM MDT Sat Sep 2 2017

.SHORT TERM...(Today and tonight)
Issued at 256 AM MDT Sat Sep 2 2017

An upper level ridge will intensify over the western U.S. today.
The center of the ridge will be over Utah by this evening. This
will bring a weak northerly flow to the area. Temperatures will
warm 3-6 degrees today putting most locations over northeast
Colorado in the upper 80s to lower 90s. There will be a slight
chance for a few weak showers and thunderstorms over the higher
terrain. If any develop, they will be weak and short lived. For
the Front Range, it is expected to be mostly sunny today. However,
smoke from wildfires in Montana is expected to increase over
eastern Colorado today and may reduce visibility to 5 to 10 miles.
With the warm airmass in place, expect overnight lows to be mild
and mainly in the mid 50s to lower 60s over northeast Colorado.

.LONG TERM...(Sunday through Friday)
Issued at 256 AM MDT Sat Sep 2 2017

Continued dry and warm conditions for the region as a large upper
ridge remains entrenched over the northern portions of the Great
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Basin. Sunday will be the warmest day of the period with possible record-breaking temperatures. Highs are currently expected to match the current record high of 95 degrees with the possibility of breaking it. As the ridge deepens over the region a lee side sfc trough will build with increasing 700mb temperatures. RH values will bottom out in the lower teens Sunday afternoon with close to zero storm possibility. Monday will start out warm as well with lows overnight staying in the 60s. The upper ridge will move slightly west allowing for a trough to drop out of Canada and across the Great Plains and NE Colorado. This will drag a cold front into Colorado from the North by the late afternoon. The front will bring enough lift with QG ascent for isolated storms due to the continued lack of BL moisture. Main hazards will most likely be gusty winds. Temperatures for Monday will also be above average but could be stunted by the cooler temperatures with the front right around peak heating.

Tuesday will see dramatically lower temperatures on the order of 15 to 20 degrees from Sunday with highs on the plains in the lower 70s. Conditions will be more stable so storms will be isolated if they form at all and with little convection to speak of.

By mid week the upper ridge will build back in with gradually increasing temperatures. Highs will be closer to seasonal normals with values in the lower to mid 80s. Storm coverage will continue to be isolated to scattered mainly over the higher terrain.

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.AVIATION...(For the 06Z TAFS through 06Z Saturday night)
Issued at 256 AM MDT Sat Sep 2 2017

Mostly clear skies will prevail through tonight and into Sunday.

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Smoke from wildfires over the Northern Rockies is expected to be
thicker today and may reduce visibility to 5 miles. Normal light
diurnal winds will persist today and tonight.

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.BOU WATCHES/WARNINGS/ADVISORIES...
None.
&&

$$

SHORT TERM...Meier
LONG TERM...Bowen
AVIATION...Meier
222
FXUS65 KBOU 021526
AFDBOU
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Area Forecast Discussion

National Weather Service Denver/Boulder CO

926 AM MDT Sat Sep 2 2017

.UPDATE...

Issued at 909 AM MDT Sat Sep 2 2017

Upper ridge of high pressure continues to build over the Great Basin and much of the Western U.S. today with a resultant northerly flow aloft over Colorado. This flow will continue to bring in smoke and hazy skies from fires from Montana and much of the Pacific Northwest. Morning sounding at Denver also showed significant inversion has developed around 600mb. This stability and mainly dry air will keep the plains dry through tonight. There could be an isolated shower/thunderstorm over the mountains, while models showing any convection today will be confined down over Summit and Park counties. Temperatures will be a bit warmer today with readings around 90 degrees on the plains. Little change to ongoing forecast.

&&

.AVIATION...(For the 18Z TAFS through 18Z Sunday afternoon)

Issued at 909 AM MDT Sat Sep 2 2017

Main impact at terminals will be smoke/hazy conditions under northerly flow aloft and resultant reduced surface and slant wise visibilities down to 5-7 miles. Airmass dry and stable today with no storms expected at terminals. Surface winds will shift northeast and east during the afternoon hours.

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.BOU WATCHES/WARNINGS/ADVISORIES...

None.

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UPDATE...Entrekin

AVIATION...Entrekin

779

FXUS65 KBOU 022039

AFDBOU
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Area Forecast Discussion
National Weather Service Denver/Boulder CO
239 PM MDT Sat Sep 2 2017

.SHORT TERM...(This evening through Sunday)
Issued at 108 PM MDT Sat Sep 2 2017

Broad high pressure aloft over much of the Western U.S. will remain over the region with a light north to northwest flow aloft over Colorado. With this flow pattern, expect the hazy/smoky skies to continue tonight with smoke being transported from fires across Montana and the Pacific Northwest. Some mountain cumulus this afternoon but no showers. Park county looks about the only spot for an isolated shower through early evening.

The airmass will remain mainly dry with even warmer temperatures expected on Sunday. Highs on Sunday will be around record high temperatures with readings in the mid 90s. Continued dry on the plains with just a tiny chance for a storm in the mountains, mainly south of interstate 70.

.LONG TERM...(Sunday night through Saturday)
Issued at 108 PM MDT Sat Sep 2 2017

Continued dry and warm conditions will continue Sunday night across the area under the influence of the upper ridge over the Great Basin and into UT.

A potent upper trough sinking into the northerly Great Plains and into the Great Lakes area on Monday will push a strong cold front down the lee of the Rockies. Current timing will be late afternoon. This timing along with some increase in upper level moisture ahead of the trough will help keep temperatures

moderated, cooler than tomorrows potential record breaking readings. North to northeasterly winds will push down with speeds of 20 to 30 mph, with higher gusts possible. Lift from the front and upward QG motion will allow for some isolated to scattered high based storms to form. Limited moisture will make gusty outflow winds the main impact from the storms. Recent models have brought in more moisture compared to previous runs, where stratus behind the front looks more probable across the Front Range. This will make it possible for even lower high te With this flow pattern, expect the hazy/smoky skies to continue tonight with smoke being transported from fires across Montana and the Pacific Northwest. mperatures for Tuesday as high surface pressure remains over the Great Plains. I lowered forecast highs in response to this. Limited chance for storms with the stable post frontal airmass, though the mountains will likely be above and able to see isolated afternoon storms, as well as a slight chance over the Palmer Divide.

Wednesday through Saturday, the upper ridge over the western states will slowly weaken and push east. This will bring warmer temperatures as well as an increasing chance for afternoon and evening storms, mainly over the mountains beginning Thursday, then possibly out onto the plains Friday and Saturday. No model though is showing great moisture, leaving only a chance for weak storms with light rain.

&&

.AVIATION...(For the 18Z TAFS through 18Z Sunday afternoon)
Issued at 108 PM MDT Sat Sep 2 2017

Hazy/smoky conditions remain over the region under light northerly flow aloft. Could see some continued light visibility reductions (5-7sm) in surface/slant wise visibilities over terminals through

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tonight. No storms expected under dry and stable airmass.

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.BOU WATCHES/WARNINGS/ADVISORIES...
None.
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SHORT TERM...Entrekin
LONG TERM...Kriederman
AVIATION...Entrekin
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891
FXUS65 KBOU 040919
AFDBOU

Area Forecast Discussion
National Weather Service Denver/Boulder CO
319 AM MDT Mon Sep 4 2017

.SHORT TERM...(Today and tonight)
Issued at 319 AM MDT Mon Sep 4 2017

The strong upper level ridge over the western states will shift
west tonight as an upper level trough digs south over the Great
Lakes. A cold associated with this will drop south across eastern
Colorado this afternoon and early evening. Ahead of it, it will be
a very warm day with highs climbing into the upper 80s to lower
90s. Will have the cooler highs over the far north where the front
will push through during the mid afternoon. Smoke from wildfires
```

will be thicker today and may slow heating. Will have low pops in the forecast for this afternoon and evening. Instability and moisture are not great, but enough forcing behind the front could produce a few weak showers and thunderstorms. Upslope northeast winds will result in the best chance for the showers and storms being over the higher terrain west and south of Denver. It will be cooler tonight with lows falling into the upper 40s to lower 50s. A stratus layer is expected to form after midnight. This will limit radiational cooling and prevent overnight lows from falling more.

It will be a smokey day across the area due to the wildfires over Montana and the Pacific Northwest. Visibility is ranging from 3 to 6 miles across southeast Wyoming, western Nebraska, and over northeast Colorado. Expect this reduced visibility to persist through the morning and gradually improve through the afternoon. The cold front is expected to clear the smoke out of the area this evening.

.LONG TERM...(Tuesday through Sunday)
Issued at 319 AM MDT Mon Sep 4 2017

Tuesday will provide a nice respite from the heat behind a strong cold front that moved into the region late Monday. Increased stratus deck will provide for mild temperatures overnight and continued below average highs for Tuesday. Models have diverged slightly with the GFS trending warmer and the NAM trending cooler. Went middle of the road with highs in the upper 60s to lower 70s on the plains. Conditions will remain pretty stable so storm changes are next to nil...however some heating lift provided the elevation of the foothills and Palmer Divide will provide for isolated convection by the late afternoon and evening. Main hazards will be brief moderate rain and gusty winds. Overnight into Wednesday QG subsidence will increase across the state

helping to clear out lingering cloud cover and increase radiational cooling on the plains. This will help to drop temperatures into the mid to upper 40s by Wednesday morning.

By Wednesday the upper ridge will have extended north into British Columbia and moved slightly east over the state. This will help to gradually increase temperatures back to seasonal normals and usher in dryer conditions on the plains. Storm coverage will be low on Wednesday and will increase through the week as subtropical moisture increases under the ridge. Overall temperatures will stay around seasonal normals with an uptick in afternoon storm potential...especially over the higher terrain into the weekend.

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.AVIATION...(For the 06Z TAFS through 06Z Monday night)
Issued at 319 AM MDT Mon Sep 4 2017

Smoke will reduce visibility to 3 to 6 miles through at least 18Z. The smoke aloft is thick enough that the ASOS/AWOS sensors are detecting it and reporting cloud heights of 3000-6000 feet. Expect visibility to gradually improve after 18Z. A cold front will push through the Denver area around 21Z. This will bring gusty northeast winds, with gusts to 25-30 knots behind the front. This will also clear out the smoke and improve visibility. Just a slight chance for a thunderstorm behind the front, 21Z to 03Z. Due to the low chances, will not mention thunderstorms in the TAFs. A layer of stratus is expected to form after 06Z with ceilings in the 4000 to 7000 feet range.

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.BOU WATCHES/WARNINGS/ADVISORIES...

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None.
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SHORT TERM...Meier
LONG TERM...Bowen
AVIATION...Meier
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198

FXUS65 KBOU 041634

AFDBOU

Area Forecast Discussion

National Weather Service Denver/Boulder CO

1034 AM MDT Mon Sep 4 2017

.UPDATE...

Issued at 1034 AM MDT Mon Sep 4 2017

Main story today is the smoke. Large plume evident on GOES-16 imagery stretching from the Pacific NW across the Central Plains. The southern extent is now across most of the forecast area, and will be spreading into Park county later today. Air quality is poor to say the least.

We will see some improvement to air quality behind a cold front. This front has pushed through Casper, Wyoming and will move through northeast Colorado this afternoon. There may be some slowing of the front for a few hours during peak heating and mixing, but by evening smoke conditions will be improving from northeast to southwest across the plains. We liked the HRRR Near-Surface Smoke product, as upstream observations support clearing of smoke in the low levels. However, it will remain quite hazy overnight with an upper level smoke plume remaining.

Otherwise, only an isolated shower/storm or two possible this afternoon and evening, and some high level stratus on track overnight. Forecast on track.

&&

.AVIATION...(For the 18Z TAFS through 18Z Tuesday afternoon)
Issued at 1034 AM MDT Mon Sep 4 2017

Smoke/haze is now expected to reduce visibility into the 3 to 5 mile range through at least 00Z. After 00Z-02Z, there should be gradual improvement in surface visibility per upstream observations and HRRR Near-Surface Smoke product. Cold front, or at least a piece of it, is expected to bring an increase of northeast winds toward 21Z, with a few gusts to around 25 knots possible for a couple hours. There is just a slight chance for a passing shower or high based storm behind the front, 23Z to 03Z. Due to the low chances, will not mention thunderstorms in the TAFs. A layer of stratus is expected to form after 06Z tonight with ceilings in the 4000 to 7000 feet range.

&&

.BOU WATCHES/WARNINGS/ADVISORIES...
None.
&&

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UPDATE...Barjenbruch
AVIATION...Barjenbruch

189

FXUS65 KBOU 042042

AFDBOU

Area Forecast Discussion

National Weather Service Denver/Boulder CO

242 PM MDT Mon Sep 4 2017

.SHORT TERM...(This evening through Tuesday)

Issued at 242 PM MDT Mon Sep 4 2017

Leading push of cold front has moved through Denver metro area, but little cooling with this one. Main front was now pushing through Greeley and Fort Collins, and will move through Denver and the rest of the plains late this afternoon. Surface observations show smoke is eroding from the northeast, so improvement will continue to occur behind the front through the evening. Latest HRRR Near-Surface Smoke represents this nicely so have largely adopted this field for smoke forecast tonight. While the plains largely scour out of the near surface smoke, we do anticipate the smoke plume aloft to keep hazy conditions in place on the plains, and some smoke in the high country.

With regard to thunderstorms, frontal surge this afternoon should push any convection farther to the south and across the Palmer Divide. Any convection will only be isolated in coverage. Overnight, we should eventually see some high based stratus development. Maybe a couple sprinkles from that otherwise dry conditions will persist through Tuesday.

Highs on Tuesday will be considerably cooler in post frontal airmass. Most of the plains should see highs closer to 70F.

.LONG TERM...(Tuesday night through Monday)
Issued at 242 PM MDT Mon Sep 4 2017

Tuesday night a large upper level ridge of high pressure will stretch from British Colombia south into northern Mexico...with a deep upper level trough of low pressure covering much of the central and eastern United States. Colorado is stuck between these two systems under the influence of a dry northwesterly flow aloft. The combination of the dry and cool airmass in the wake of Monday's strong cold front and mostly clear skies will lead to cool temperatures across the plains Wednesday morning. Most locations across northeastern Colorado should see low temperatures in the 40s.

A gradual warming trend is expected through the end of the work week as the upper ridge remains entrenched over the western half of the United States.

By Friday...the upper ridge breaks down somewhat and shifts eastward over the Rocky Mountain Region. This is in response to an upper level trough of low pressure deepening along the west coast of the United States. This pattern should allow some subtropical moisture to flow into Colorado from the south and southwest...resulting in increasing precipitation chances...mainly across the high country. Models show moisture continuing to increase over the weekend which may result in better chances for afternoon and evening showers and storms across the plains and Palmer Divide. The GFS...ECMWF and GEM Models are are showing another cold front moving across northeastern Colorado on Monday which could result in another cool and cloudy day. Since this is all the way out in day 8...have decided only to lower high temperatures only a few degrees at this time.

&&

.AVIATION...(For the 18Z TAFS through 18Z Tuesday afternoon)
Issued at 242 PM MDT Mon Sep 4 2017

Smoke/haze is beginning to clear over the northeast plains behind frontal passage. Therefore, the 3-5 mile visibility in the Denver metro area airports is expected to improve 00Z-04Z as northeast low level winds blow in the cleaner airmass. Isolated high based shower/storm threat is shifting south, and appears most of the activity through 02Z will be confined to near or just south of KAPA. A higher layer of stratus is still expected to form after 06Z tonight and remain through about 16-18Z Tuesday before dissipating. Ceilings expected to be in the 4000 to 7000 feet range. Gusty northeast winds up to 25-30 knots will decrease toward 01Z and then become more east/southeast through 12Z Tuesday.

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.BOU WATCHES/WARNINGS/ADVISORIES...
None.
&&

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SHORT TERM...Barjenbruch
LONG TERM...Kalina
AVIATION...Barjenbruch

Friday, September 1, 2017

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY THROUGH 0130Z September 2, 2017

SMOKE:
Continental US...
Numerous wildfires throughout the Northwestern US, California and southern British Columbia continue to burn and are collectively responsible for an enormous light density smoke plume over the western U.S., the north central U.S., the Mississippi River Valley, the Great Lakes Region, northern Pennsylvania and most of New York. Mush of the western coast of the US is patched in moderately dense smoke that also stretches off northern California and southwestern Oregon into the eastern Atlantic. Patches of moderate smoke is also visible over the Northern Rockies. Moderate to heavily dense smoke was present over north-central US and the Mississippi Valley.

Canada...
Light density remnant smoke was visible over southern Canada, Nunavut, and Hudson Bay stretching from eastern British Columbia to southeastern Ontario this evening. Heavily dense smoke stretched from central Manitoba, southeastern Nunavut, Hudson Bay and western Ontario.

Dust:
An area of dust was visible in the eastern Caribbean Sea with a portion stretching over the Dominican Republic and Turks and Caicos Islands.

BOLL

(source: http://www.ssd.noaa.gov/PS/FIRE/DATA/SMOKE/2017/2017l020201.html)

Saturday, September 2, 2017

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY THROUGH 18:30Z September 2, 2017

SMOKE:
Canada:
Alberta...
Fires in Central Alberta were seen producing light plumes of smoke traveling east into Saskatchewan near Clearwater River Park.

British Columbia...
Multiple fires in the southern part of the province were observed emitting smoke that was traveling north east.

Continental US:
A large swath of remnant smoke was observed over the Western portion of the country. Reaching from the west coast as far east as Illinois.

Washington State...
Fires in the central part of the state were observed producing heavy smoke that was seen traveling north east.

Oregon...
Fires in the south western portion of the state were emitting thick plumes of smoke traveling south west out to sea.

California...
Fires in the north western portion of the state were emitting thick plumes of smoke traveling south west out to sea. A large fire was observed near Fresno emitting moderate amounts of smoke traveling north west. Another large fire near Yosemite National Park was observed emitting moderate amounts of smoke traveling north west.

(source: http://www.ssd.noaa.gov/PS/FIRE/DATA/SMOKE/2017/2017l021900.html)

Saturday, September 2, 2017

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 0100Z September 3, 2017

SMOKE:

Southwest Canada/Western/Central US:
Smoke stretches across a very large area of the western/central US with smoke moving into the Plains and Mississippi Valley. Residual smoke stretches as far south as southern Arizona/New Mexico and central Texas and as far east as western Wisconsin, Illinois and central Missouri.
Fires burning across California, western Oregon, central/eastern Washington, northern/central Idaho, western Montana and southern British Columbia/Alberta are producing large pockets of dense to very dense smoke.
Smoke from wildfires in California and Oregon are moving north while fires across Washington, southern Canada and Idaho/Montana is moving west in direction. A very large pocket of heavy smoke stretches into the Pacific Ocean and through western/central Oregon then into central/eastern Washington State and across Idaho, southern Alberta and into western Montana.
Some small pockets of residual medium smoke is seen over southeast Montana, western/southern South Dakota and south central Nebraska.

Central/Eastern Canada:
Fires burning in central Saskatchewan are producing moderately dense to dense smoke moving east into Manitoba. The full extent of smoke is not seen due to cloud cover.
Residual smoke is seen moving easterly across eastern Manitoba, western Ontario and central sections of the Hudson Bay. Another large area of residual smoke is seen moving east over eastern Ontario, northern/central Quebec, over Newfoundland/Labrador and into the Labrador Sea. The smoke source is most likely from fires burning in central Canada and possibly southern British Columbia/Alberta.

J Kibler

(source: http://www.ssd.noaa.gov/PS/FIRE/DATA/SMOKE/2017/2017I030401.html)

Sunday, September 3, 2017

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 0200Z September 4, 2017

SMOKE:
Continental US/Southern Canada...
An unbroken area of smoke is seen spanning most of the northern and central US and southern Canada from the Pacific Coast to the Great Lakes and Ohio and Tennessee Valleys. The smoke covers most of northern and central California northward to southern British Columbia where the smoke then turns to the east across Idaho, Montana and Wyoming into the

northern and central Plains reaching as far south as Oklahoma and the Texas Panhandle. It continues east thru the mid and upper Mississippi Valley to the western Great Lakes with a more narrow finger across the length of Tennessee and North Carolina and then off the mid Atlantic Coast before turning to the north toward Cape Cod.

The thickest smoke covered a large area from northern California into western and central Oregon, eastern Washington, northern Idaho and then fanning out across most of Montana and into the northern Plains reaching Minnesota and Iowa.

Central Canada...
A cluster of wildfires in northern Saskatchewan were producing a plume of moderate to dense smoke that extended to the southeast across central Manitoba into western Ontario. A few other smaller fires over extreme southwest Nunavut were generating an area of light smoke that extended to the southeast into northwest Alberta.

Pacific Ocean...
Smoke from the western wildfires extends off the Pacific Northwest coast and then curls counter-clockwise southward spiraling to nearly 20N roughly midway between southern California and Hawaii.

DUST:
Montana/Saskatchewan...
A plume of blowing dust continued into this evening originating from Big Muddy Lake in south central Saskatchewan and moving to the southeast across far northeast Montana and into western North Dakota.

Ruminski

(source: http://www.ssd.noaa.gov/PS/FIRE/DATA/SMOKE/2017/2017I040709.html)

Monday, September 4, 2017

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 1630Z September 4, 2017

SMOKE:
Continental US/Southern Canada...
An expansive area of varying density smoke is seen spanning most of the northern and central US and southern Canada from the Pacific Coast to the St. Lawrence River Valley. The smoke covers most of coastal California northward into southern British Columbia. From there, the smoke crosses Idaho, Montana and Wyoming into the northern and central Plains reaching as far south as Oklahoma and the Texas Panhandle. It continues east through the Great Lakes with a narrow swath extending northeast across the St. Lawrence River. Two minor features to point out regarding this plume are a feature that is oriented transverse to the flow that moves across western Pennsylvania and a remnant feature over northeastern Texas, Arkansas, Mississippi, and northern Louisiana. The thickest smoke covered a large area from far northeastern Washington across northern Idaho, Montana, northern Wyoming, South Dakota, southern Minnesota, much of Wisconsin and Iowa, and southern Nebraska. The parent wildfires for this smoke plume are those across the western CONUS and southern British Columbia

Central Canada...
A cluster of wildfires in northern Saskatchewan were producing a plume of light to moderate smoke that extended to the southeast across central and southern Manitoba into northwestern Minnesota. Remnant smoke from these fires was also observed across southeastern Alberta and southern Saskatchewan spreading southwestward. A smaller wildfire over northeast Alberta was generating an area of light smoke that extended only slightly to the southeast, remaining in northeast Alberta.

Newfoundland/Atlantic Ocean...
An area of light density remnant smoke was observed over the northern Atlantic and Newfoundland. The remnant smoke extends back along what appears to be a cold front that extends southwestward over the Outer Banks of North Carolina.

Nunavut...
An area of remnant smoke was seen draped across southern Nunavut and the Canadian Archipelago. The origin of this remnant smoke in uncertain, but could be associated with the layer of remnant smoke seen over Newfoundland. The large cyclone over Hudson Bay could be picking up some of the smoke and dragging it across the Davis Strait. However, cloud cover blankets the region between the two features, so any association between the two is just speculation.

Pacific Ocean...
Smoke from wildfires in northern Washington extends off the Pacific Northwest coast to about 135W and then stretches to the north into the Alaskan Panhandle and to the south around 25N.

ED_002666_00009483-00156

Hosley

(source: http://www.ssd.noaa.gov/PS/FIRE/DATA/SMOKE/2017/2017I042029.html)

Monday, September 4, 2017

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 0200Z September 5, 2017

SMOKE:
Continental US/Southern Canada...
An expansive area of mostly moderate to dense smoke is seen spanning most of the northern and central US and southern Canada from the Pacific Coast to New England. The smoke covers most of the northern two thirds of California and out into the Pacific northward across Oregon and Washington into southern British Columbia. From there, the smoke crosses Idaho, Montana and Wyoming and dips into the central Plains reaching as far south as Oklahoma and the Texas Panhandle. It continues east through the mid Mississippi Valley, Great Lakes and the Ohio and Tennessee Valleys into New York and northern New England. A narrow swath of light smoke extends across North Carolina to the Outer Banks.

Central Canada...
A cluster of wildfires in northern Saskatchewan were producing a plume of light to moderate smoke that extended to the southeast across southwest Manitoba into northwestern Minnesota.

Pacific Ocean...
An area of moderate to dense smoke from the California and Oregon wildfires extends off the coast to the west of the fires to about 126W. A more expansive area of light to possibly moderate smoke was seen extending further down the California coast. Another batch of older remnant smoke was seen well offshore between 130W and 140W extending from near 25N all the way to the southeast Alaska coast.

Ruminski

(source: http://www.ssd.noaa.gov/PS/FIRE/DATA/SMOKE/2017/2017l050702.html)

Appendix C: Wildfire Incident Information

Note: **the source for all information below is https://inciweb.ncwg.gov unless otherwise noted.**

Cottonwood One (acres burned, 8/31-9/1)

Cottonwood One - Detailed Report for 09/02/2017 18:30

Issued on Feb 08, 2018 17:13 MT

Incident No.: WY-SHX-017357

Cause: Unknown

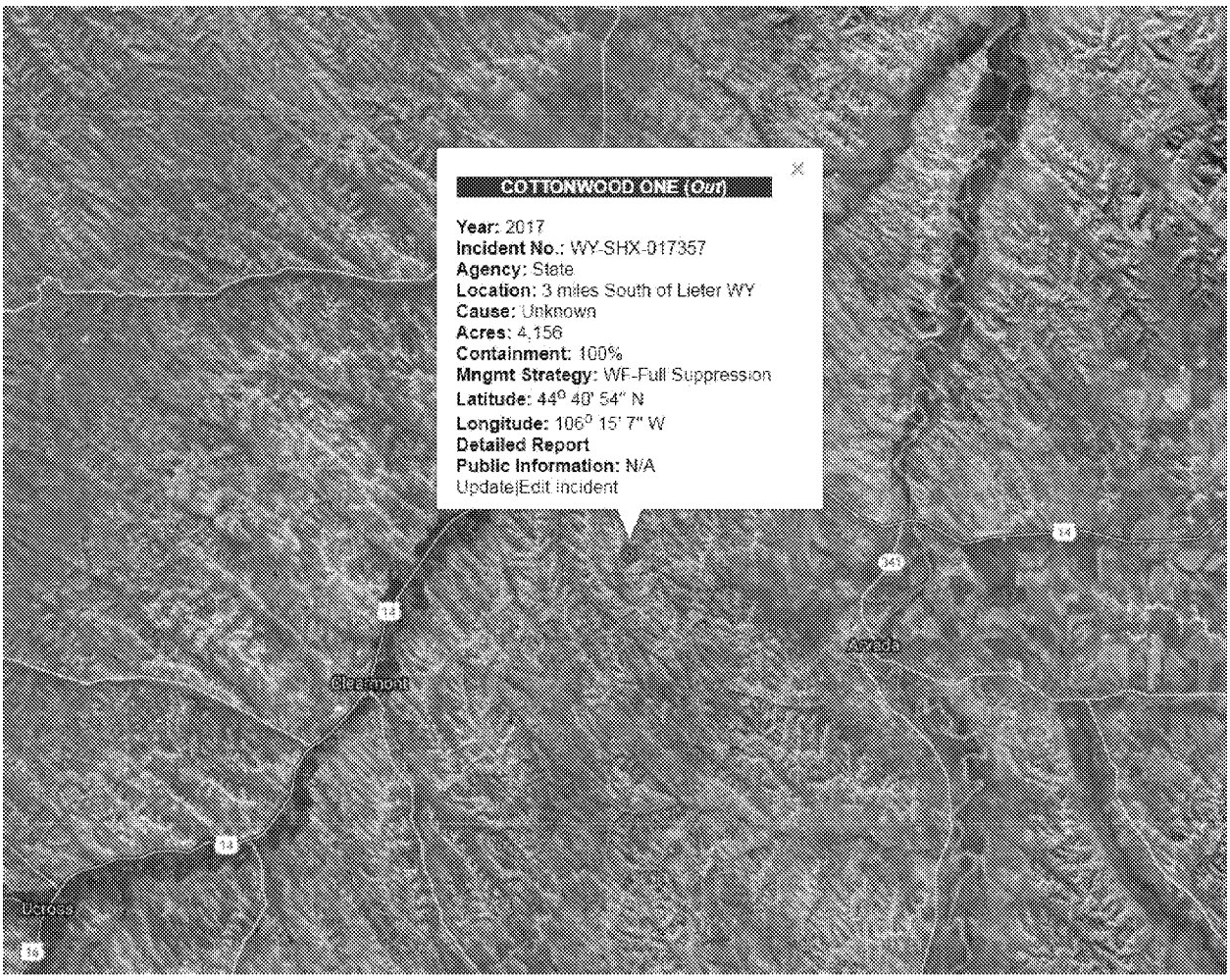
Start Date: 08/31/2017 08:42

Status: Out

Out Date: Unknown

Report Date/ Time	Report Incident No.	Incident Type	Status	IC Name	Incident Command Organization	Reported Acres	Remarks
09/02/2017 18:30	WY-SHX-017357	WF-Full Suppression	Out	Thompson	Type 3 IC	4,156	Read
09/02/2017 08:37	WY-SHX-017357	WF-Full Suppression	Active	Thomas / Shroyer	Type 3 IC	4,156	Read
08/31/2017 08:42	WY-SHX-017357	WF-Full Suppression	Active	Thomas/Arty /Haines	Type 3 IC	3,500	Read

(source: https://gacc.nifc.gov/rmcc/)



(source: https://gacc.nifc.gov/rmcc/incident_info.php)

National Interagency Coordination Center
Incident Management Situation Report
Friday, September 1, 2017 – 0530 MT
National Preparedness Level 5

National Fire Activity

Initial attack activity:	Light (144) new fires
New large incidents:	18
Large fires contained:	5
Uncontained large fires:**	56
Area Command Teams Committed:	1
NIMOs committed:	2
Type 1 IMTs committed:	13
Type 2 IMTs committed:	27

**Uncontained large fires include only fires being managed under a full suppression strategy
Link to Geographic Area daily reports.

On August 31, a firefighter from the Los Padres NF, Santa Lucia RD, was fatally injured in a vehicle accident while returning to their home unit from the Railroad fire on the Sierra NF. The firefighting community extends its condolences to family and friends of the deceased.

One MAFFS C-130 airtanker and support personnel each from the 146th Airlift Wing, (California Air National Guard), 153rd Airlift Wing, (Wyoming Air National Guard) and the 302nd Airlift Wing (Colorado Springs, Air Force Reserve) have been deployed to Fresno, CA in support of wildland fire operations.

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Active Incident Resource Summary

GACC	Fires	Cumulative Acres	Crews	Engines	Helicopters	Total Personnel
AICC	0	0	0	0	0	0
NWCC	29	426,921	242	511	66	9,828
ONCC	13	143,947	156	442	25	6,146
OSCC	8	36,749	43	207	14	2,294
NRCC	49	412,282	80	369	49	5,082
GBCC	27	188,248	34	66	18	1,409
SWCC	1	1,850	0	0	0	7
RMCC	5	4,437	7	27	6	349
EACC	0	0	0	0	0	0
SACC	2	1,029	1	7	2	56
Total	134	1,205,466	563	1,629	180	25,171

Incident Name	Unit	Size		%	Ctn/ Comp	Est	Personnel		Resources			Strc Lost	$$ CTD	Origin Own
		Acres	Chge				Total	Chge	Crw	Eng	Heli			
Schodde	ID-JMX	473	0	100	Ctn	---	0	-17	0	0	0	0	25K	CNTY
Valmy	NV-WID	5,467	0	100	Ctn	---	0	-14	0	0	0	0	250K	BLM
Vista	NV-WID	5,920	0	100	Ctn	---	0	-10	0	0	0	0	200K	BLM

JMX – Jerome County

Southern Area (PL 4)

New fires:	4
New large incidents:	0
Uncontained large fires:	0
Type 2 IMTs Committed	3

Hurricane Harvey, Texas A&M Forest Service. Affected area encompasses much of the Texas and Louisiana Gulf Coast. Texas IMT 2 (Hanneman) has mobilized to Rockport, TX to assist with coordinating city and county response efforts. NYFD IMT 2 has been mobilized to the Regional Staging Area in Katy, TX. IMT 2 (Parrish) has been mobilized to the Regional Staging Area in Beaumont, TX.

Incident Name	Unit	Size		%	Ctn/ Comp	Est	Personnel		Resources			Strc Lost	$$ CTD	Origin Own
		Acres	Chge				Total	Chge	Crw	Eng	Heli			
Hurricane Harvey	TX-TXS	N/A	---	N/A	N/A	---	1,635	853	0	100	0	0	NR	ST

Rocky Mountain Area (PL 2)

New fires:	10
New large incidents:	1
Uncontained large fires:	1

*** Cottonwood One,** Sheridan County. Three miles south of Lieter, WY. Brush and short grass. Active fire behavior with running. Structures and sage-grouse habitat threatened.

Incident Name	Unit	Size		%	Ctn/ Comp	Est	Personnel		Resources			Strc Lost	$$ CTD	Origin Own
		Acres	Chge				Total	Chge	Crw	Eng	Heli			
* Cottonwood One	WY-SHX	3,500	---	0	Ctn	9/30	57	---	0	13	2	0	1K	CNTY

Alaska Area (PL 1)

New fires:	0
New large incidents:	1
Uncontained large fires:	0

*** Paddle Creek,** Upper Yukon Zone, BLM. Started on Alaska Native Corporation land 15 miles northeast of Circle, AK. Timber and short grass. Minimal fire behavior with smoldering. Last report unless significant activity occurs.

Campbell River, Upper Yukon Zone, BLM. Previously reported incident. Started on FWS land 65 miles northeast of Chalkyitsik, AK. Timber, brush and short grass. Minimal fire behavior with creeping and smoldering. Structures threatened. Last report unless significant activity occurs.

(source: https://www.predictiveservices.nifc.gov/intelligence/archive/archive2017.html)

National Interagency Coordination Center
Incident Management Situation Report
Saturday, September 2, 2017 – 0530 MT
National Preparedness Level 5

National Fire Activity

Initial attack activity:	Light (130) new fires
New large incidents:	10
Large fires contained:	7
Uncontained large fires:**	60
Area Command Teams Committed:	1
NIMOs committed:	2
Type 1 IMTs committed:	12
Type 2 IMTs committed:	27

**Uncontained large fires include only fires being managed under a full suppression strategy
Link to Geographic Area daily reports.

One MAFFS C-130 airtanker and support personnel each from the 146th Airlift Wing, (California Air National Guard), 153rd Airlift Wing, (Wyoming Air National Guard) and the 302nd Airlift Wing (Colorado Springs, Air Force Reserve) have been deployed to Fresno, CA in support of wildland fire operations.

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Active Incident Resource Summary

GACC	Fires	Cumulative Acres	Crews	Engines	Helicopters	Total Personnel
AICC	0	0	0	0	0	0
NWCC	52	453,603	235	524	67	9,633
ONCC	11	166,741	151	415	30	5,840
OSCC	8	35,517	62	215	14	2,793
NRCC	48	573,211	77	376	58	5,129
GBCC	23	220,628	35	56	18	1,388
SWCC	1	1,870	0	0	0	6
RMCC	5	5,091	7	28	6	309
EACC	0	0	0	0	0	0
SACC	1	809	0	1	0	6
Total	129	1,457,672	567	1,616	193	25,104

Incident Name	Unit	Size		%	Ctn/ Comp	Est	Personnel		Resources			Strc Lost	$$ CTD	Origin Own
		Acres	Chge				Total	Chge	Crw	Eng	Heli			
Ibex	ID-SCF	14,503	527	0	Comp	10/30	35	0	1	0	1	0	900K	FS
* Whiskey	ID-TFD	1,500	---	15	Ctn	9/2	40	---	0	7	0	0	80K	BLM
* Timber Peak	NV-SND	7,000	---	0	Comp	UNK	19	---	1	0	1	0	30K	BLM
Piney	NV-NNS	1,594	---	99	Ctn	UNK	63	---	2	1	1	0	110K	ST

Southern Area (PL 4)

New fires: 9
New large incidents: 0
Uncontained large fires: 0
Type 2 IMTs Committed 3

Hurricane Harvey, Texas A&M Forest Service. Affected area encompasses much of the Texas and Louisiana Gulf Coast. Texas IMT 2 (Hanneman) has mobilized to Rockport, TX to assist with coordinating city and county response efforts. NYFD IMT 2 has been mobilized to the Regional Staging Area in Katy, TX. IMT 2 (Parrish) has been mobilized to the Regional Staging Area in Beaumont, TX.

Incident Name	Unit	Size		%	Ctn/ Comp	Est	Personnel		Resources			Strc Lost	$$ CTD	Origin Own
		Acres	Chge				Total	Chge	Crw	Eng	Heli			
Hurricane Harvey	TX-TXS	N/A	---	N/A	N/A	---	1,030	-605	0	100	0	0	NR	ST

Rocky Mountain Area (PL 2)

New fires: 6
New large incidents: 0
Uncontained large fires: 1

Cottonwood One, Sheridan County. Three miles south of Lieter, WY. Brush and short grass. Moderate fire behavior with running and smoldering. Structures and sage-grouse habitat threatened.

Incident Name	Unit	Size		%	Ctn/ Comp	Est	Personnel		Resources			Strc Lost	$$ CTD	Origin Own
		Acres	Chge				Total	Chge	Crw	Eng	Heli			
Cottonwood One	WY-SHX	4,156	656	60	Ctn	9/30	57	0	0	13	2	0	200K	CNTY

(source: https://www.predictiveservices.nifc.gov/intelligence/archive/archive2017.html)

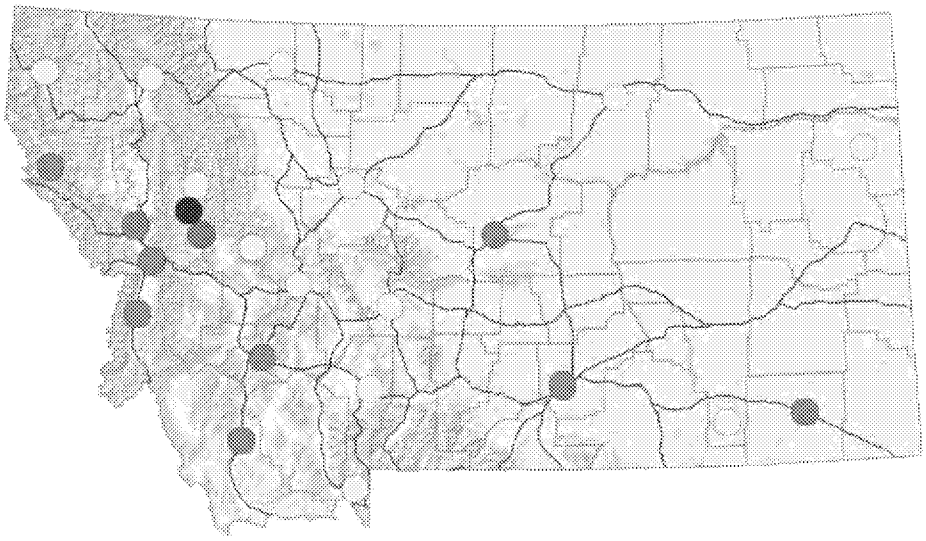
Tidwell/Brush Flat (acres burned, 8/31-9/1)

http://billingsgazette.com/news/local/battle-complex-fire-burns-across-eastern-montana-northern-wyoming/article_17a00313-da9e-5af4-be62-2b0d26119e20.html

TOPICAL

Battle Complex fire burns across Eastern Montana, Northern Wyoming

By MIKE KORDENBROCK mkordenbrock@billingsgazette.com Sep 2, 2017



A screen grab from the Montana Department of Environmental Quality website showing all air quality stations with less than moderate health effects. Red indicates unhealthy air, orange means air unhealthy for sensitive groups, yellow signifies moderate air quality and gray means data is unavailable.

BUY NOW

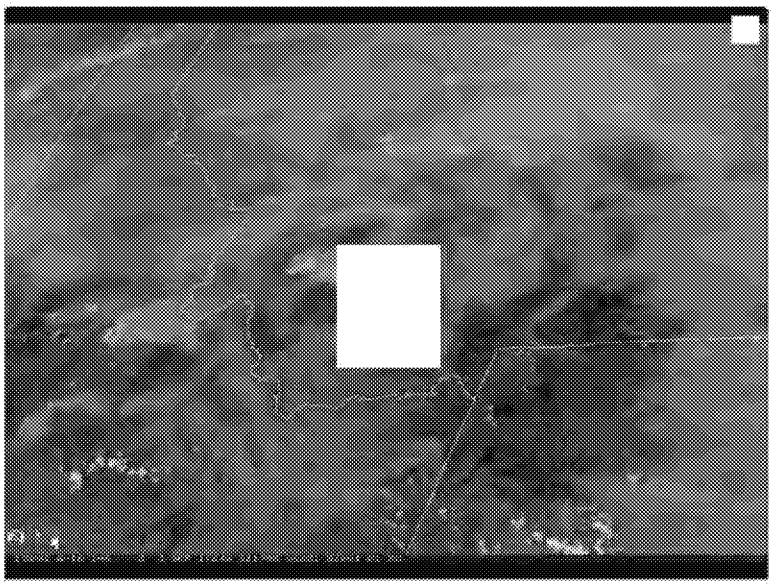
A pair of fires that began to burn Wednesday night and Thursday morning have merged to create a blaze spanning southeastern Montana and northern Wyoming that is estimated to be 90,445 acres.

That estimate is less than half the original estimated size of the fire, which as of Saturday morning was believed to be as large as 185,000 acres.

Known as the Battle Complex, the fire is made up of the 73,285-acre Brush Flat fire and the 17,160-acre Tidwell fire.

Note: "Wednesday night and Thursday morning" is highlighted to document the origin of the fire to late August 30/early August 31.

The Brush Flat was initially reported to be burning in Big Horn County 14 miles south of Birney on private land and is reported by Miles City Interagency Dispatch to be lightning-caused. Al Nash, chief of communications with the Bureau of Land Management's Montana-Dakotas state office, said that fire was first reported Thursday morning at about 8 a.m. The fires combined and crossed over into Sheridan County, Wyoming.



NOAA Satellites PA
@NOAASatellitePA

NOAA's #GOES16 captured #wildfires torching parts of #Montana late yesterday, September 3, 2017.

7:29 AM - Sep 4, 2017

25 931 742

Of the 73,285 acres the Brush Flat fire has burned, the majority are in Wyoming, Nash said. That fire was 30 percent contained as of Saturday night, according to Nash.

ED_002666_00009483-00166

The Tidwell fire was reported Thursday night before 9 p.m. and is burning on private land in Big Horn County 38 miles south of Ashland. Miles City Interagency Dispatch also lists it as lightning-caused. Saturday night it was completely contained, Nash said.

"There's a small number of federal, state and county firefighters who have been on this blaze since it began," Nash said, speaking Saturday afternoon. "They've also of course had some air tanker support."

"The bottom line is there has been extraordinarily active behavior but the crews that are assigned to the fire feel very good about the progress they've made on this particular blaze," Nash said. "This is simply another case, this is another example, of how our drought conditions, coupled with some hot, dry, windy weather has resulted in some explosive fire growth."

Mike Kordenbrock
Night Reporter

General assignment reporter for The Billings Gazette.

(source: http://billingsgazette.com/news/local/battle-complex-fire-burns-across-eastern-montana-northern-wyoming/article_17a00313-da9e-5af4-be62-2b0d26119e20.html)

National Interagency Coordination Center
Incident Management Situation Report
Friday, September 1, 2017 – 0530 MT
National Preparedness Level 5

National Fire Activity

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EACC	0	0	0	0	0	0
SACC	2	1,029	1	7	2	56
Total	134	1,205,466	563	1,629	180	25,171

* **Patrol Ridge,** Nez Perce – Clearwater NF. Forty-six miles southwest of Hamilton, MT. Timber. Minimal fire behavior with single-tree torching, flanking and backing. Last report unless significant activity occurs.

* **Pettibone,** Nez Perce – Clearwater NF. Thirty-three miles southwest of Hamilton, MT. Timber and short grass. Moderate fire behavior with isolated torching, backing and creeping. Last report unless significant activity occurs.

* **Cub Creek,** Kootenai NF. Seven miles south of Trout Creek, MT. Timber. Active fire behavior with uphill runs, group torching and spotting. Last report unless significant activity occurs.

Incident Name	Unit	Size		%	Ctn/ Comp	Est	Personnel		Resources			Strc Lost	$$ CTD	Origin Own
		Acres	Chge				Total	Chge	Crw	Eng	Heli			
Rice Ridge	MT-LNF	33,365	1,143	18	Comp	10/1	729	47	15	58	4	0	25.7M	FS
East Fork	MT-RBA	20,000	17,500	0	Ctn	9/16	100	3	1	15	0	5	250K	BIA
Sartin Draw	MT-MCD	80,000	72,130	5	Ctn	9/9	121	23	2	14	1	0	300K	FS
Meyers	MT-BDF	25,342	1,739	5	Ctn	10/21	292	-31	2	14	2	0	23.7M	FS
Lolo Peak	MT-LNF	39,719	258	31	Ctn	10/1	684	-17	13	40	5	10	35.4M	FS
Alice Creek	MT-HLF	6,850	1,109	0	Comp	10/2	188	11	2	12	3	0	3.9M	FS
Liberty	MT-FHA	14,732	909	22	Comp	10/15	435	6	5	11	2	1	14.1M	BIA
Sapphire Complex	MT-LNF	40,135	0	51	Comp	10/31	405	-10	6	25	5	8	30M	FS
Sprague	MT-GNP	3,275	1,178	35	Comp	11/1	126	-2	1	1	1	0	1.8M	NPS
Caribou	MT-KNF	3,290	635	0	Comp	10/30	102	20	1	3	1	0	1.6M	FS
Gibralter Ridge	MT-KNF	6,565	620	27	Comp	9/30	38	-57	0	8	0	0	8.3M	FS
Conrow	MT-BDF	2,727	0	85	Ctn	9/6	208	0	6	7	1	0	1.7M	CNTY
Sunrise	MT-LNF	25,937	0	90	Comp	9/30	253	-50	2	13	5	0	29.5M	FS
Hanover	ID-NCF	20,221	1,611	88	Comp	10/15	76	0	2	3	2	0	10.4M	FS
Wolverine	MT-BFA	3,035	0	85	Ctn	UNK	10	-6	0	4	0	2	85K	BIA
Ditch Creek	MT-HLF	127	0	47	Ctn	9/2	69	0	2	2	2	0	776K	FS
Blue Bay	MT-FHA	490	0	80	Ctn	9/1	72	-39	1	3	5	0	2.2M	BIA
Nelson Creek	MT-BRF	220	15	25	Ctn	9/30	119	3	4	4	1	0	350K	FS
Painted Hill	MT-NCA	2,496	---	90	Ctn	UNK	26	---	0	8	0	0	30K	BIA
Trail Creek	MT-NCA	300	---	98	Ctn	9/1	9	---	0	2	0	0	50K	BIA
1026	MT-MCD	8,214	6,358	80	Ctn	UNK	17	17	0	5	0	0	150K	BLM
Snake	MT-MCD	5,247	---	0	Ctn	9/6	34	---	0	11	0	0	100K	PRI
* Sheep Gap	MT-LNF	770	---	0	Ctn	10/15	48	---	2	1	0	0	250K	FS
* MM 19	MT-LG03	1,806	---	30	Ctn	9/1	47	---	0	14	1	0	60K	CNTY
* Upper Midway	MT-FHA	604	---	80	Ctn	9/4	34	---	1	2	0	0	150K	BIA
* Tidwell	MT-MCD	10,000	---	0	Ctn	9/9	27	---	0	7	0	0	10K	PRI
* Brush Flat	MT-MCD	20,000	---	0	Ctn	9/9	26	---	0	7	0	0	200K	PRI
* Snider	MT-MCD	3,262	---	0	Ctn	9/9	0	---	0	0	0	0	10K	PRI
* Scalp	MT-FNF	2,225	---	0	Comp	11/1	5	---	0	0	0	0	10K	FS

(source: https://www.predictiveservices.nifc.gov/intelligence/archive/archive2017.html)

National Interagency Coordination Center
Incident Management Situation Report
Saturday, September 2, 2017 – 0530 MT
National Preparedness Level 5

National Fire Activity

Initial attack activity:	Light (130) new fires
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Large fires contained:	7
Uncontained large fires:**	60
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NIMOs committed:	2
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Type 2 IMTs committed:	27

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Sapphire Complex	MT-LNF	40,528	393	53	Comp	10/31	381	-24	5	23	5	6	30.5M	FS
Sprague	MT-GNP	4,646	1,371	35	Comp	11/1	106	-20	0	1	1	1	2M	NPS
Caribou	MT-KNF	4,818	1,528	0	Comp	10/30	100	-2	0	3	1	0	1.8M	FS
Gibralter Ridge	MT-KNF	6,588	23	37	Comp	10/31	81	43	1	10	0	0	8.3M	FS
Conrow	MT-BDF	2,727	0	95	Ctn	9/6	189	-39	5	6	1	0	2M	CNTY
Wolverine	MT-BFA	3,035	0	88	Ctn	UNK	10	0	0	4	0	2	85K	BIA
Ditch Creek	MT-HLF	127	0	57	Ctn	9/2	65	-4	2	1	2	0	788K	FS
Blue Bay	MT-FHA	490	0	80	Ctn	UNK	65	-7	1	3	4	0	2.2M	BIA
Nelson Creek	MT-BRF	270	50	30	Ctn	9/30	107	-12	4	4	1	0	500K	FS
Upper Midway	MT-FHA	620	16	80	Ctn	9/4	39	5	1	2	2	0	175K	BIA
Tidwell	MT-MCD	12,610	2,610	20	Ctn	9/9	23	-4	0	6	0	0	100K	PRI
Brush Flat	MT-MCD	167,840	147,840	10	Ctn	9/9	28	2	0	7	0	0	200K	PRI
* Cold Smoke	MT-CMR	350	---	0	Ctn	UNK	15	---	0	5	0	0	15K	FWS
* McCully	MT-NWS	200	---	0	Ctn	9/21	41	---	0	11	0	0	50K	ST
* Sarpy Fork	MT-MCD	362	---	50	Ctn	9/2	38	---	0	11	0	0	5K	PRI
Painted Hill	MT-NCA	2,496	---	90	Ctn	9/5	26	---	0	1	0	0	30K	BIA
Snider	MT-MCD	3,282	0	100	Ctn	---	0	0	0	0	0	0	10K	PRI
1026	MT-MCD	8,214	0	100	Ctn	---	5	-12	0	2	0	0	150K	BLM
Trail Creek	MT-NCA	300	0	100	Ctn	---	0	-9	0	0	0	0	100K	BIA
Snake	MT-MCD	7,360	2,113	100	Ctn	---	0	-34	0	0	0	0	100K	PRI
MM 19	MT-LG03	1,806	0	100	Ctn	---	0	0	0	0	0	0	45K	CNTY
* Quarter	MT-MCD	308	---	100	Ctn	---	0	---	0	0	0	0	50K	PRI

LG03 - Yellowstone County

Northwest Area (PL 5)

New fires:	13
New large incidents:	2
Uncontained large fires:	20
Type 1 IMTs committed:	5
Type 2 IMTs committed:	9

Chetco Bar, Rogue River - Siskiyou NF. IMT 1 (Livingston). Sixteen miles west of Selma, OR. Timber and brush. Extreme fire behavior with group torching, short crown runs and spotting. Structures threatened. Evacuations, road, trail and area closures in effect.

Jolly Mountain, Okanogan - Wenatchee NF. IMT 2 (Roide). Thirteen miles northwest of Cle Elum, WA. Timber. Active fire behavior with uphill runs, flanking and backing. Structures threatened. Evacuations, road, trail and area closures in effect.

(source: https://www.predictiveservices.nifc.gov/intelligence/archive/archive2017.html)

National Interagency Coordination Center
Incident Management Situation Report
Sunday, September 3, 2017 – 0530 MT
National Preparedness Level 5

National Fire Activity

Initial attack activity:	Light (108) new fires
New large incidents:	6
Large fires contained:	5
Uncontained large fires:**	58
Area Command Teams Committed:	2
NIMOs committed:	2
Type 1 IMTs committed:	11
Type 2 IMTs committed:	28

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OSCC	10	49,850	70	286	34	3,423
NRCC	51	502,524	65	323	60	4,850
GBCC	21	230,201	33	54	19	1,316
SWCC	1	1,870	0	0	0	6
RMCC	5	5,212	5	14	4	186
EACC	0	0	0	0	0	0
SACC	0	0	0	0	0	0
Total	131	1,435,710	556	1,660	215	25,634

Incident Name	Unit	Size		%	Ctn/ Comp	Est	Personnel		Resources			Strc Lost	$$ CTD	Origin Own
		Acres	Chge				Total	Chge	Crw	Eng	Heli			
Highway 200 Complex	MT-LNF	3,347	937	0	Ctn	10/15	211	120	2	10	5	0	1K	FS
Sunrise	MT-LNF	25,975	0	90	Comp	9/30	35	-187	0	3	4	0	30.2M	FS
* Moose Peak	MT-KNF	234	---	0	Comp	10/30	0	---	0	0	0	0	10K	FS
Sprague	MT-GNP	5,116	470	35	Comp	11/1	120	14	1	1	1	1	2.2M	NPS
East Fork	MT-RBA	21,500	0	10	Ctn	9/17	170	70	2	15	0	5	700K	BIA
Meyers	MT-BDF	30,486	1,572	5	Ctn	10/21	333	11	3	17	3	0	24.8M	FS
Lolo Peak	MT-LNF	42,687	1,348	31	Ctn	10/1	478	-99	4	25	6	10	37.2M	FS
Alice Creek	MT-HLF	7,440	432	5	Comp	10/2	203	-1	2	12	3	0	4.9M	FS
Liberty	MT-FHA	15,581	219	22	Comp	10/15	425	-53	5	9	2	1	15.1M	BIA
Sapphire Complex	MT-LNF	40,858	130	53	Comp	10/31	358	-23	3	23	4	6	31M	FS
Sartin Draw	MT-MCD	91,142	11,142	45	Ctn	9/9	212	22	4	21	0	0	657K	FS
Brush Flat	MT-MCD	73,285	-94,555	30	Ctn	9/9	28	0	0	7	0	0	300K	PRI
Tidwell	MT-MCD	17,160	4,550	60	Ctn	9/9	83	40	2	6	0	0	100K	PRI
Conrow	MT-BDF	2,741	14	97	Ctn	9/6	113	-56	3	6	1	0	2.4M	CNTY
* West Fork	MT-KNF	800	---	0	Comp	10/7	54	---	0	6	0	0	100K	FS
Wolverine	MT-BFA	3,035	0	88	Ctn	UNK	10	0	0	4	0	2	85K	BIA
Ditch Creek	MT-HLF	127	0	86	Ctn	UNK	44	-21	1	1	2	0	913K	FS
Blue Bay	MT-FHA	490	0	80	Ctn	9/9	70	5	1	3	5	0	2.2M	BIA
Nelson Creek	MT-BRF	270	0	30	Ctn	9/30	90	-17	3	4	1	0	500K	FS
Upper Midway	MT-FHA	620	0	80	Ctn	9/4	29	-10	1	2	0	0	175K	BIA
Cold Smoke	MT-CMR	1,050	700	30	Ctn	9/4	22	7	0	4	0	0	171K	FWS
McCully	MT-NWS	530	330	0	Ctn	9/21	62	21	0	7	0	0	200K	ST
* Hawk Ridge	MT-NCA	500	---	30	Ctn	9/6	13	---	0	4	0	0	100K	BIA
* Black	NT-FHA	310	---	50	Comp	UNK	3	---	0	0	1	0	175K	BIA
Painted Hill	MT-NCA	2,496	0	90	Ctn	9/5	4	0	0	1	0	0	35K	BIA
Sarpy Fork	MT-MCD	382	0	100	Ctn	---	0	-38	0	0	0	0	5K	PRI

Northwest Area (PL 5)

New fires:	18
New large incidents:	0
Uncontained large fires:	19
Area Command teams committed:	1
Type 1 IMTs committed:	5
Type 2 IMTs committed:	10

Jolly Mountain, Okanogan - Wenatchee NF. IMT 2 (Roide). Thirteen miles northwest of Cle Elum, WA. Timber. Extreme fire behavior with crowning and backing. Structures threatened. Evacuations, road, trail and area closures in effect.

(source: https://www.predictiveservices.nifc.gov/intelligence/archive/archive2017.html)

Sartin Draw (acres burned, 8/31-9/1)

National Interagency Coordination Center
Incident Management Situation Report
Thursday, August 31, 2017 – 0530 MT
National Preparedness Level 5

National Fire Activity

Initial attack activity:	Moderate (210) new fires
New large incidents:	14
Large fires contained:	5
Uncontained large fires:**	50
Area Command Teams Committed:	1
NIMOs committed:	1
Type 1 IMTs committed:	12
Type 2 IMTs committed:	24

**Uncontained large fires include only fires being managed under a full suppression strategy
Link to Geographic Area daily reports.

One MAFFS C-130 airtanker and support personnel each from the 146th Airlift Wing, (California Air National Guard), 153rd Airlift Wing, (Wyoming Air National Guard) and the 302nd Airlift Wing (Colorado Springs, Air Force Reserve) have been deployed to Fresno, CA in support of wildland fire operations.

One RC-26 aircraft and support personnel from the 141st Aerial Refueling Wing (Washington Air National Guard) has been deployed to Fairchild AFB (Spokane, WA) in support of wildland fire operations.

One RC-26 aircraft and support personnel from the 130th Air Wing, (West Virginia National Guard) has been deployed to Redding Municipal Airport (Redding, CA) in support of wildland fire operations.

Active Incident Resource Summary

GACC	Fires	Cumulative Acres	Crews	Engines	Helicopters	Total Personnel
AICC	0	0	0	0	0	0
NWCC	30	407,779	234	518	67	9,646
ONCC	11	118,294	132	320	22	4,846
OSCC	7	21,929	48	74	13	1,496
NRCC	38	270,174	82	337	51	4,969
GBCC	33	166,099	32	85	17	1,490
SWCC	1	1,800	0	0	0	13
RMCC	3	667	4	6	3	157
EACC	0	0	0	0	0	0
SACC	2	1,029	1	7	2	56
Total	125	989,773	533	1,347	175	22,655

Incident Name	Unit	Size		%	Ctn/ Comp	Est	Personnel		Resources			Strc Lost	$$ CTD	Origin Own
		Acres	Chge				Total	Chge	Crw	Eng	Heli			
Meyers	MT-BDF	23,603	366	5	Ctn	10/21	323	38	4	10	5	0	23.3M	FS
Conrow	MT-BDF	2,727	0	75	Ctn	9/6	208	48	6	7	1	0	1.6M	CNTY
Caribou	MT-KNF	2,655	1,055	0	Comp	10/30	82	0	0	0	0	0	2.5M	FS
Gibralter Ridge	MT-KNF	5,945	945	27	Comp	9/30	95	---	1	10	1	0	7.8M	FS
Sapphire Complex	MT-LNF	40,135	310	51	Comp	10/31	415	-6	6	29	5	6	29.7M	FS
Sunrise	MT-LNF	25,937	0	90	Comp	9/30	303	-21	2	14	5	0	29.2M	FS
Sprague	MT-GNP	2,097	223	35	Comp	11/1	128	0	1	1	1	0	1.7M	NPS
Hanover	ID-NCF	18,610	1,007	88	Comp	10/15	76	-129	2	3	2	0	10.3M	FS
East Fork	MT-RBA	2,500	1,463	0	Ctn	9/14	97	16	1	14	0	0	100K	BIA
Wolverine	MT-BFA	3,035	0	85	Ctn	UNK	18	-3	0	5	0	2	85K	BIA
Painted Hill	MT-NCA	2,496	0	90	Ctn	8/31	28	0	0	8	0	0	30K	BIA
Blue Bay	MT-FHA	490	0	60	Ctn	9/1	111	0	2	3	5	0	2.1M	BIA
Trail Creek	MT-NCA	300	0	98	Ctn	9/1	9	0	0	2	0	0	50K	BIA
Ditch Creek	MT-HLF	127	0	30	Ctn	9/2	69	0	2	2	2	0	722K	FS
Nelson Creek	MT-BRF	205	55	15	Ctn	9/30	116	51	4	4	1	0	250K	FS
1028	MT-MCD	2,256	400	80	Ctn	UNK	9	---	0	4	0	0	100K	BLM
* Snake	MT-MCD	5,247	---	0	Ctn	9/6	34	---	0	11	0	0	100K	PRI
* Sartin Draw	MT-MCD	7,870	---	0	Ctn	9/6	98	---	2	14	1	0	100K	FS
Mendenhall	MT-LG40	1,275	0	100	Ctn	---	129	-5	1	17	1	2	674K	CNTY

LG40 – Sweet Grass County

Northern California Area (PL 4)

New fires:	35
New large incidents:	1
Uncontained large fires:	4
Type 1 IMTs committed:	2
Type 2 IMTs committed:	4

CA-KNF-006098 Complex, (4 fires). Klamath NF. IMT 1 (McGowan). Ten miles northwest of Happy Camp, CA. Timber and brush. Active fire behavior with torching and running. Structures threatened. Road, trail and area closures in effect.

Salmon August Complex, (3 fires). Klamath NF. IMT 2 (Fogle) and IMT 2 (Zombro). Nine miles west of Etna, CA. Timber. Active fire behavior with flanking, backing and group torching. Structures threatened. Road, trail and area closures in effect.

Orleans Complex, (4 fires). Six Rivers NF. IMT 2 (Young). Twenty miles north of Orleans, CA. Timber and brush. Active fire behavior with wind-driven runs, flanking and backing. Road, trail and area closures in effect.

Ponderosa, Butte Unit, Cal Fire. Cal Fire IMT 1 (Patterson). Nine miles northeast of Oroville, CA. Timber and brush. Active fire behavior with short crown runs, group torching and short-range spotting. Structures threatened. Road and trail closures in effect.

(source: https://www.predictiveservices.nifc.gov/intelligence/archive/archive2017.html)

National Interagency Coordination Center
Incident Management Situation Report
Friday, September 1, 2017 – 0530 MT
National Preparedness Level 5

National Fire Activity

Initial attack activity:	Light (144) new fires
New large incidents:	18
Large fires contained:	5
Uncontained large fires:**	56
Area Command Teams Committed:	1
NIMOs committed:	2
Type 1 IMTs committed:	13
Type 2 IMTs committed:	27

**Uncontained large fires include only fires being managed under a full suppression strategy
Link to Geographic Area daily reports.

On August 31, a firefighter from the Los Padres NF, Santa Lucia RD, was fatally injured in a vehicle accident while returning to their home unit from the Railroad fire on the Sierra NF. The firefighting community extends its condolences to family and friends of the deceased.

One MAFFS C-130 airtanker and support personnel each from the 146th Airlift Wing, (California Air National Guard), 153rd Airlift Wing, (Wyoming Air National Guard) and the 302nd Airlift Wing (Colorado Springs, Air Force Reserve) have been deployed to Fresno, CA in support of wildland fire operations.

One RC-26 aircraft and support personnel from the 141st Aerial Refueling Wing (Washington Air National Guard) has been deployed to Fairchild AFB (Spokane, WA) in support of wildland fire operations.

One RC-26 aircraft and support personnel from the 130th Air Wing, (West Virginia National Guard) has been deployed to Redding Municipal Airport (Redding, CA) in support of wildland fire operations.

Active Incident Resource Summary

GACC	Fires	Cumulative Acres	Crews	Engines	Helicopters	Total Personnel
AICC	0	0	0	0	0	0
NWCC	29	426,921	242	511	66	9,828
ONCC	13	143,947	158	442	25	6,146
OSCC	8	26,749	43	207	14	2,294
NRCC	48	412,282	80	369	48	5,082
GBCC	27	188,246	34	66	18	1,409
SWCC	1	1,850	0	0	0	7
RMCC	5	4,437	7	27	6	349
EACC	0	0	0	0	0	0
SACC	2	1,029	1	7	2	56
Total	134	1,205,466	563	1,629	180	25,171

* **Patrol Ridge**, Nez Perce – Clearwater NF. Forty-six miles southwest of Hamilton, MT. Timber. Minimal fire behavior with single-tree torching, flanking and backing. Last report unless significant activity occurs.

* **Pettibone**, Nez Perce – Clearwater NF. Thirty-three miles southwest of Hamilton, MT. Timber and short grass. Moderate fire behavior with isolated torching, backing and creeping. Last report unless significant activity occurs.

* **Cub Creek**, Kootenai NF. Seven miles south of Trout Creek, MT. Timber. Active fire behavior with uphill runs, group torching and spotting. Last report unless significant activity occurs.

Incident Name	Unit	Size		%	Ctn/ Comp	Est	Personnel		Resources			Strc Lost	$$ CTD	Origin Own
		Acres	Chge				Total	Chge	Crw	Eng	Heli			
Rice Ridge	MT-LNF	33,365	1,143	18	Comp	10/1	729	47	15	58	4	0	25.7M	FS
East Fork	MT-RBA	20,000	17,500	0	Ctn	9/16	100	3	1	15	0	5	250K	BIA
Sartin Draw	MT-MCD	80,000	72,130	5	Ctn	9/9	121	23	2	14	1	0	300K	FS
Meyers	MT-BDF	35,342	1,739	5	Ctn	10/21	292	-31	2	14	2	0	23.7M	FS
Lolo Peak	MT-LNF	39,719	258	31	Ctn	10/1	684	-17	13	40	5	10	35.4M	FS
Alice Creek	MT-HLF	6,850	1,109	0	Comp	10/2	186	11	2	12	3	0	3.9M	FS
Liberty	MT-FHA	14,732	909	22	Comp	10/15	435	6	5	11	2	1	14.1M	BIA
Sapphire Complex	MT-LNF	40,135	0	51	Comp	10/31	405	-10	6	25	5	6	30M	FS
Sprague	MT-GNP	3,275	1,178	35	Comp	11/1	126	-2	1	1	1	0	1.8M	NPS
Caribou	MT-KNF	3,290	635	0	Comp	10/30	102	20	1	3	1	0	1.6M	FS
Gibraiter Ridge	MT-KNF	6,565	620	27	Comp	9/30	38	-57	0	8	0	0	6.3M	FS
Conrow	MT-BDF	2,727	0	85	Ctn	9/6	208	0	6	7	1	0	1.7M	CNTY
Sunrise	MT-LNF	25,837	0	90	Comp	9/30	253	-50	2	13	5	0	29.5M	FS
Hanover	ID-NCF	20,221	1,611	88	Comp	10/15	76	0	2	3	2	0	10.4M	FS
Wolverine	MT-BFA	3,035	0	85	Ctn	UNK	10	-6	0	4	0	2	85K	BIA
Ditch Creek	MT-HLF	127	0	47	Ctn	9/2	69	0	2	2	2	0	776K	FS
Blue Bay	MT-FHA	490	0	80	Ctn	9/1	72	-39	1	3	5	0	2.2M	BIA
Nelson Creek	MT-BRF	220	15	25	Ctn	9/30	119	3	4	4	1	0	350K	FS
Painted Hill	MT-NCA	2,496	---	90	Ctn	UNK	26	---	0	8	0	0	30K	BIA
Trail Creek	MT-NCA	300	---	98	Ctn	9/1	9	---	0	2	0	0	50K	BIA
1026	MT-MCD	8,214	6,358	80	Ctn	UNK	17	17	0	5	0	0	150K	BLM
Snake	MT-MCD	5,247	---	0	Ctn	9/6	34	---	0	11	0	0	100K	PRI
* Sheep Gap	MT-LNF	770	---	0	Ctn	10/15	48	---	2	1	0	0	250K	FS
* MM 19	MT-LG03	1,806	---	30	Ctn	9/1	47	---	0	14	1	0	80K	CNTY
* Upper Midway	MT-FHA	604	---	80	Ctn	9/4	34	---	1	2	0	0	150K	BIA
* Tidwell	MT-MCD	10,000	---	0	Ctn	9/9	27	---	0	7	0	0	10K	PRI
* Brush Flat	MT-MCD	20,000	---	0	Ctn	9/9	26	---	0	7	0	0	200K	PRI
* Snider	MT-MCD	3,262	---	0	Ctn	9/9	0	---	0	0	0	0	10K	PRI
* Scalp	MT-FNF	2,225	---	0	Comp	11/1	5	---	0	0	0	0	10K	FS

(source: https://www.predictiveservices.nifc.gov/intelligence/archive/archive2017.html)

SARTIN DRAW FIRE UPDATE

MT DNRC COUNTY ASSIST TEAM

David Hamilton, Incident Commander

County Assist Team DNRC

Saturday, September 2, 2017 Morning Update

SIZE: 91,000 acres

CONTAINMENT: 10%

CAUSE: Natural

FIRE LOCATION: 20 miles NE of Ashland, MT

RESOURCES:

31 Engines
3 Crews
5 Heavy Equipment
160 Total Personnel

Fire Situation:

Today Local, State and Federal fire resources will continue to build and improve fireline, burn out areas of unburned fire as conditions and resources allow, and mop-up one chain (66 feet) in from the fires perimeter. Firefighters will work to extinguish hot spots in timber areas and utilize available aircraft where needed. Winds today will be out of the NW around 10-15 mph.

Yesterday, fire resources accomplished a lot of great work prohibiting the fire progression. They will be working hard today to secure the fire perimeter in front of the forecasted cold front. A fire weather watch has been issued for tomorrow. The fire weather watch is for high winds, near record temperatures and single digit relative humidities.

Aviation and ground resources assisted Rosebud County with the Snider Fire yesterday. This fire is approximately 5,000 acres and has burned up to the west side of the Tongue River Road due to the fire spotting over the river. Fire resources will be working this portion of the Snider Fire to ensure no further spread.

Closures:

There are no closures currently. Expect heavy fire vehicle traffic along the Tongue River Road and other surrounding roads near the fire.

Evacuations:

Pre-evacuation notice is in place for residents located N of Merchant Cut, W of Hwy 59 and S of 674 Road. Contact the Fire information phone line listed below for Red Cross Shelter needs.

FIRE INFORMATION PHONE:
406-200-4516

INCWEB:
https://fireweb.nwcg.gov/incident/9573/

FACEBOOK:
@sartindrawfire

EMAIL:
sartindraw@gmail.com

Stage I Fire Restrictions are in effect in Eastern Montana.

CAMPFIRES and other fires are **prohibited** except in approved recreation sites, as **designated on the fire prevention order**. Liquid petroleum and LPG stoves that can be turned on and off are allowed.

SMOKING is **prohibited** outside of vehicles, buildings, and developed recreation sites, unless you are in a 3-foot-diameter area cleared of all burnable vegetation.

For more information about fire restrictions, go to:
http://firerestrictions.us

Sartin Draw Fire
Like This Page · September 2, 2017

Saturday, September 2, 2017 Morning Update

SIZE: 91,000 acres
CONTAINMENT: 10%
CAUSE: Natural... See More

Like Comment Share

92 Chronological

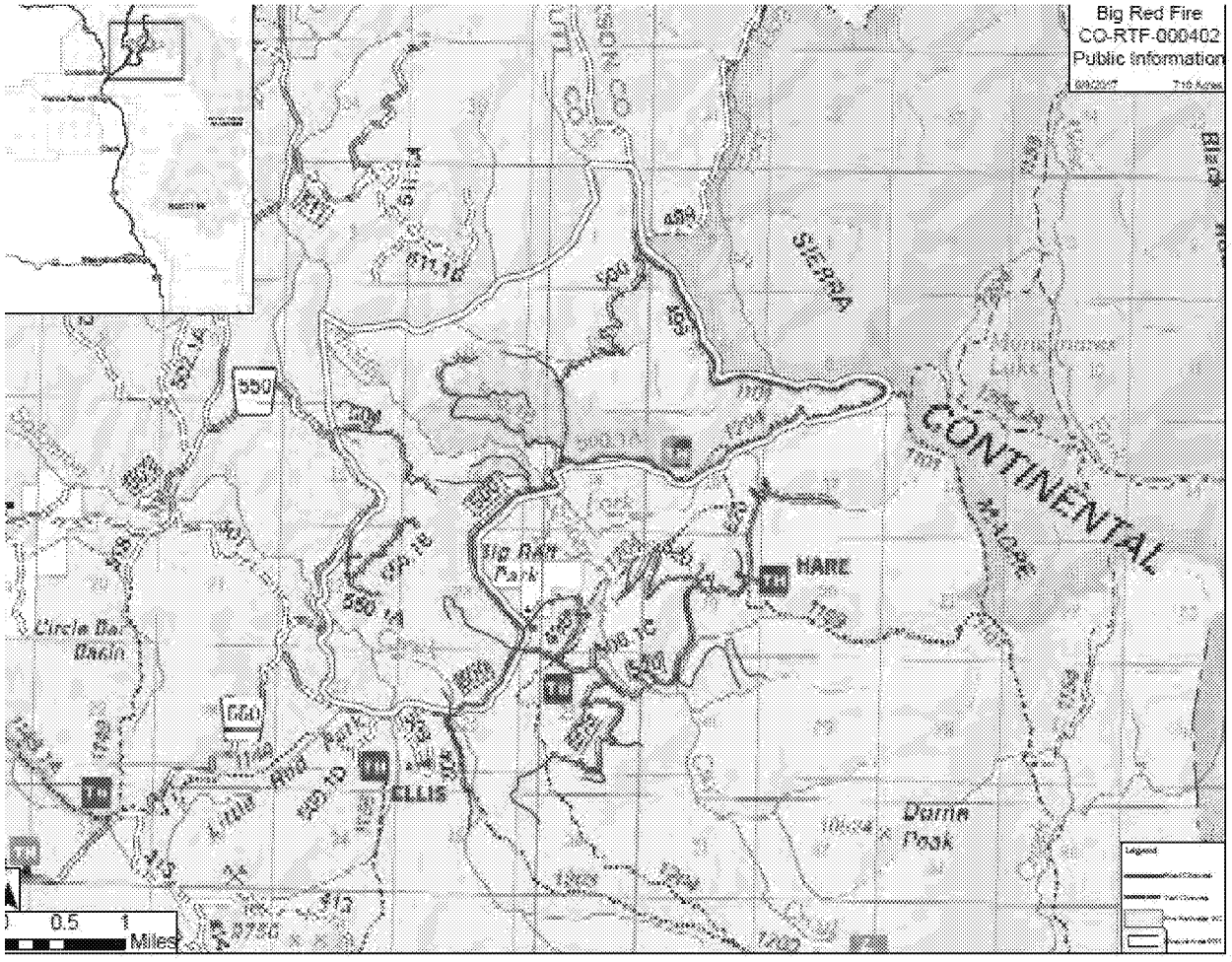
92 Shares 1 Comment

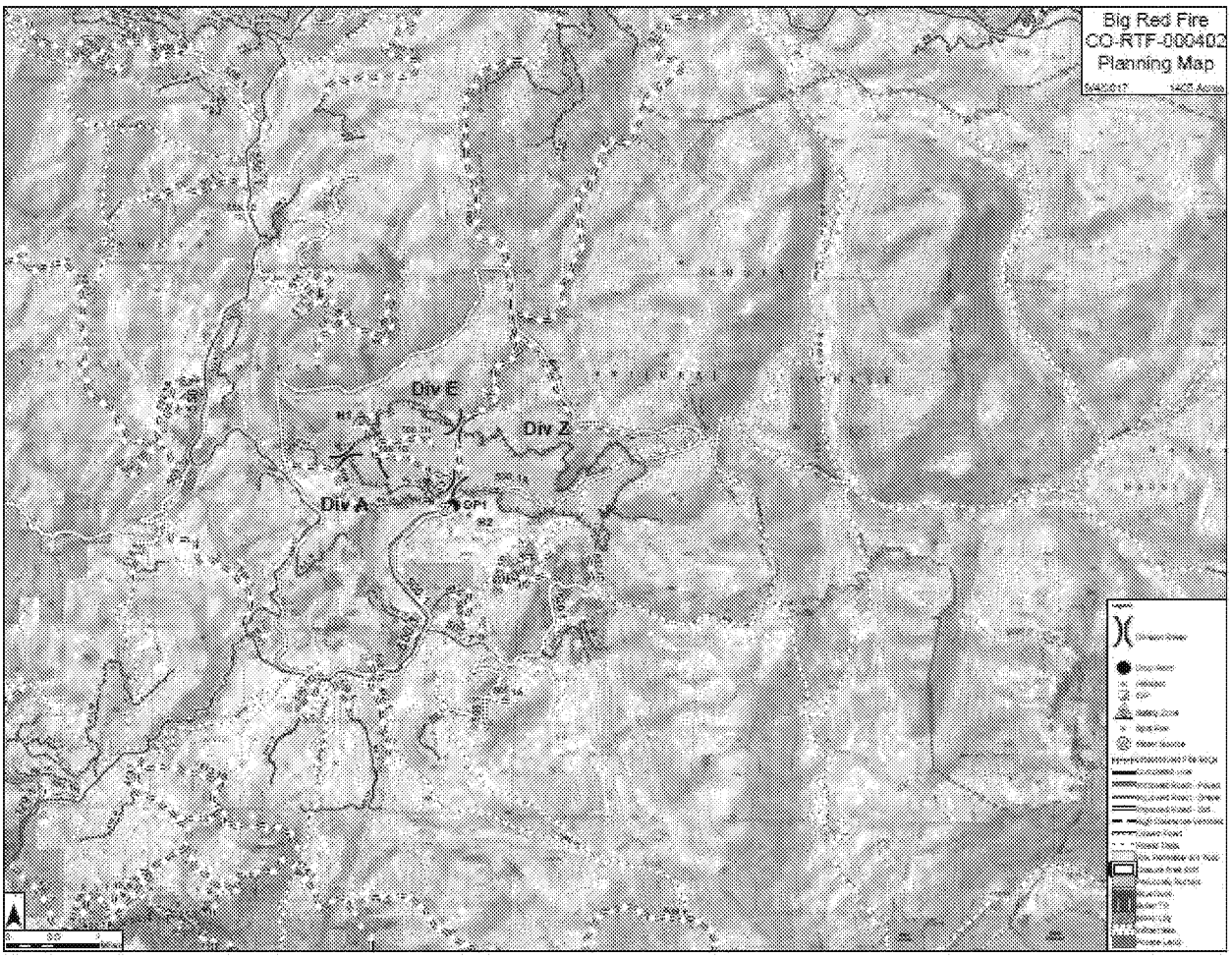
Anne Corbin Heiser Are you and the family all okay?
Like · Reply · 18w

Write a comment...

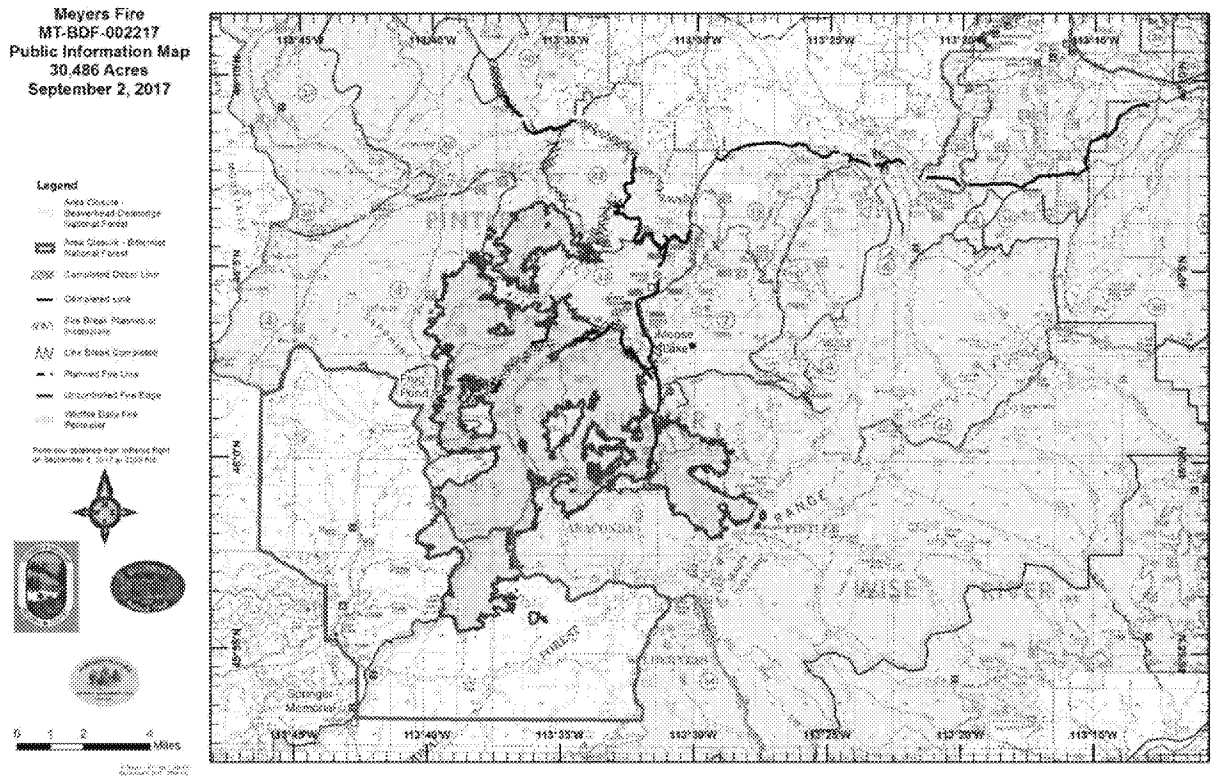
(source: https://www.facebook.com/sartindrawfire/)

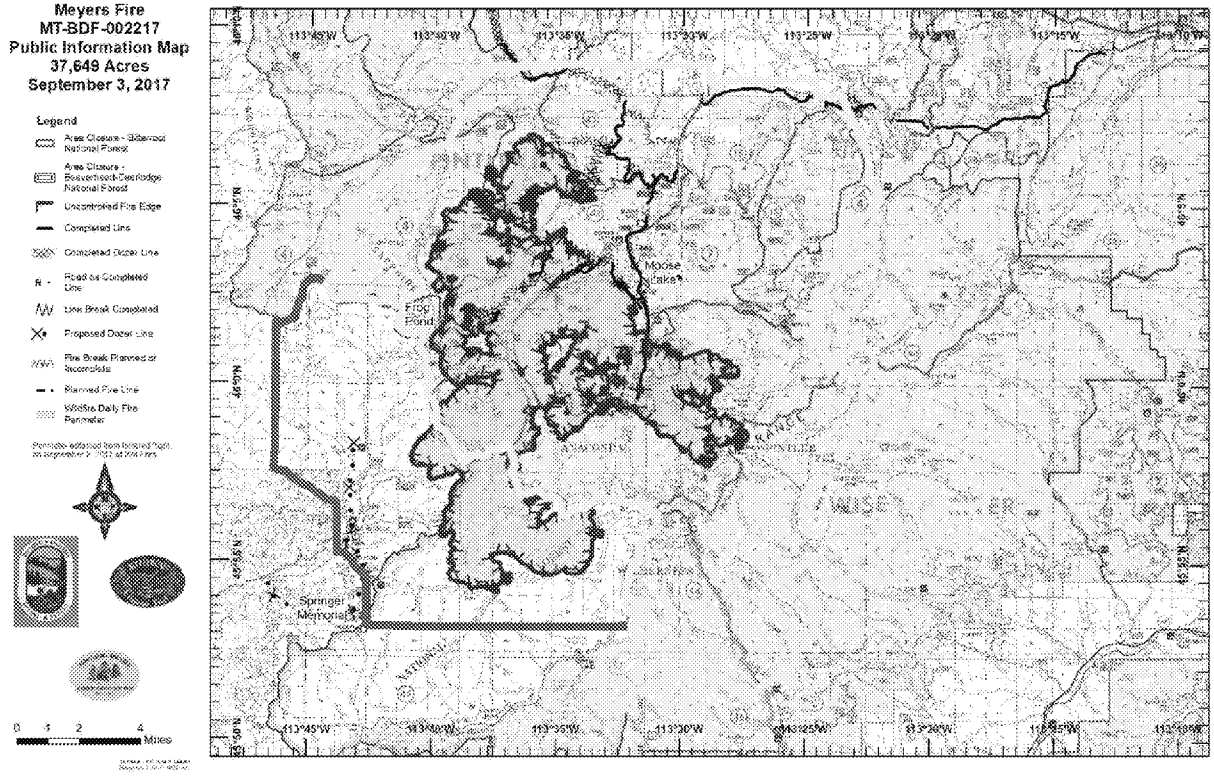
Big Red (acres burned, 9/3)



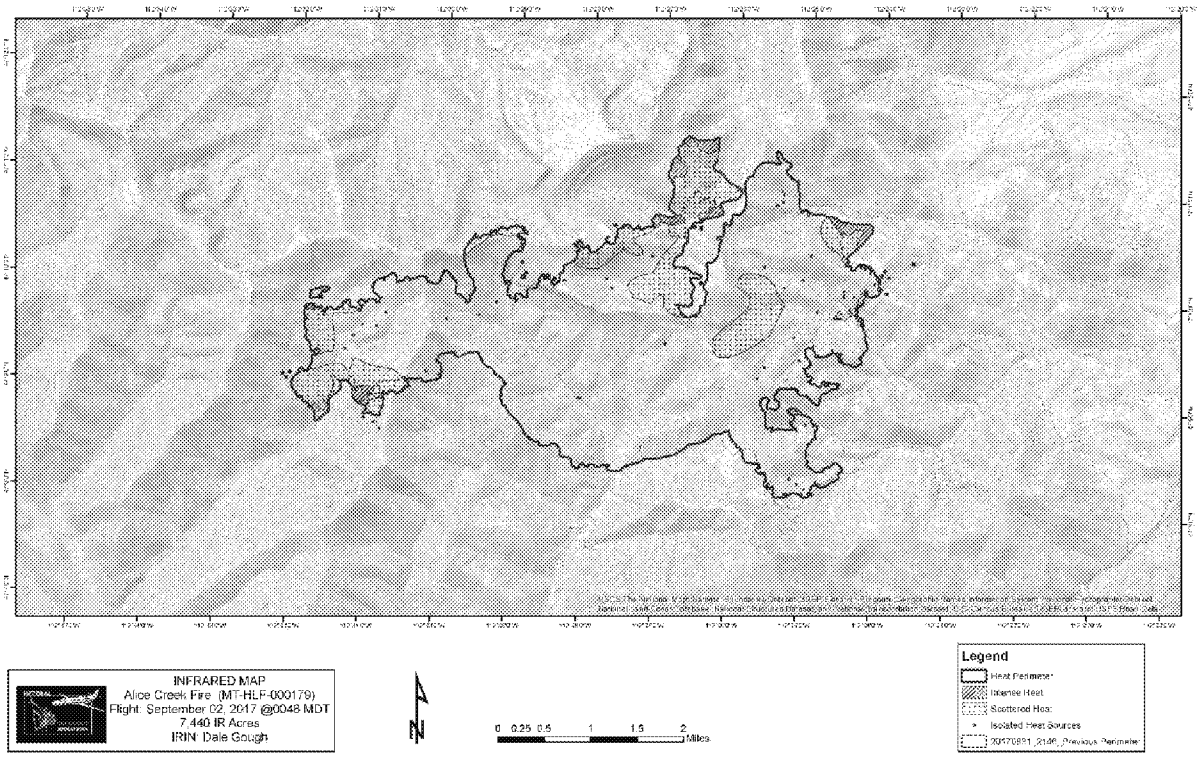

Big Red Fire
CO-RTF-000402
Planning Map
Div E
Div Z
Div A
OP1

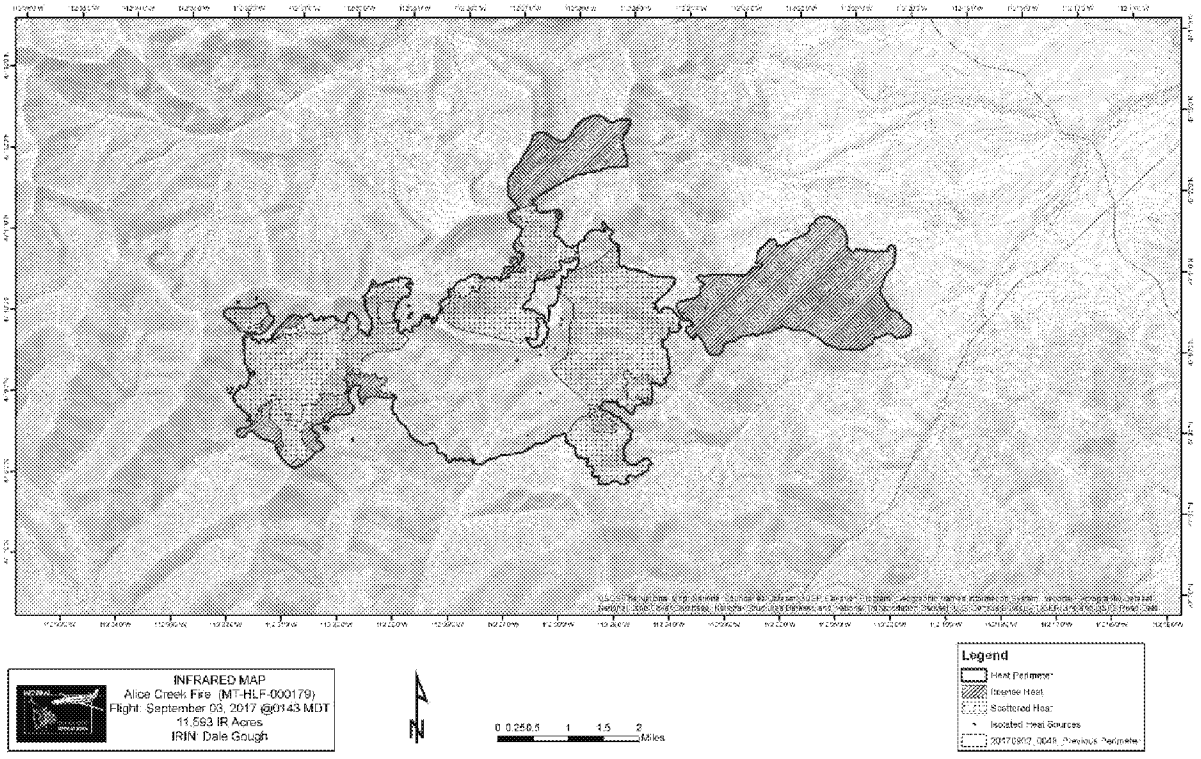
Meyers (acres burned, 9/2)





Alice Creek (acres burned, 9/2)





Strychnine (acres burned, 9/2)

InciWeb - Incident Information System

Strychnine Fire

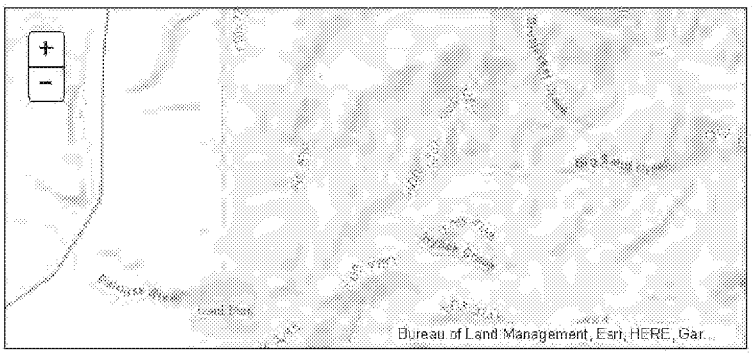
ANNOUNCEMENT

Fire investigators seek information on cause of Strychnine Fire
NEWS RELEASE FOR IMMEDIATE RELEASE Sept. 14, 2017 Fire investigators seek information on cause of Strychnine Fire (DEARY) – Fire investigators ask... more

INCIDENT UPDATED 9/14/2017

Approximate Location

46.956 latitude, -116.627 longitude zoom to incident



Incident Overview

The Strychnine Fire is located five miles northeast of Harvard, Idaho. While the fire is 100 % contained, crews will continue to mop-up and monitor the fire. Idaho Department of Lands (IDL) is being assisted by US Forest Service Nez Perce-Clearwater Forests Palouse Range District, the Coeur d'Alene Tribe, the Bureau of Land Management (BLM) and area volunteer fire crews.

The fire is currently under investigation. Please contact the Idaho Department of Lands fire managers at: (208) 666-8659 or investigation@idl.idaho.gov if you have any information about the cause of this fire. Any information provided as part of this investigation will remain confidential.

Road and area closures have been rescinded.

Image options: [Enlarge] [Full Size]

Basic Information

Current as of	9/14/2017, 12:36:01 PM
Incident Type	Wildfire
Date of Origin	Saturday September 02nd, 2017 approx. 03:30 PM
Location	4.5 miles northeast of Harvard, ID.
Incident Commander	Idaho Department of Lands- Ponderosa Area Office

Current Situation

Total Personnel	10
Size	1,010 Acres
Percent of Perimeter Contained	100%
Estimated Containment Date	Wednesday September 13th, 2017 approx. 11:00 PM
Fuels Involved	Timber (Grass and Understory) Medium Logging Slash Timber (Litter and Understory)
Significant Events	Updated: Sept 14 Area and road closures have been rescinded.

News Release
Strychnine Fire Evening Update

FOR IMMEDIATE RELEASE
September 3, 2017

(Deary) – The Strychnine Fire is five miles northeast of Harvard and estimated at 800 acres. It is burning on steep slopes in heavy timber and logging slash primarily in industrial and national forest ownership.

Idaho Department of Lands (IDL) is being assisted by US Forest Service Palouse Range District, the Coeur d'Alene Tribe, the Bureau of Land Management (BLM) and volunteer fire crews from Moscow, Potlatch, Troy, and Deary.

Air support successfully dropped both water and retardant on the fire today, slowing the progression of the fire and allowing fire crews access.

Laird Park campground remains closed, and fire officials ask motorists on highway 6 to be aware of fire agency traffic on the roadways and proceed with caution. Due to the holiday weekend, recreational use in the Palouse River drainage was significant. Visitors to the area will experience delays traveling on the Palouse River Road and associated tributary roads and trails.

The cause of the fire is currently under investigation.

# # #

NEWS MEDIA CONTACT:
Jennifer Russell
Public Information Officer
Idaho Department of Lands
208-661-5292 / 208-666-8669
jrussell@idl.idaho.gov
News | Facebook | Twitter | Web
Sign up to receive news from IDL

Sapphire Complex (acres burned, 9/2)

Daily Update 8:00 AM	Sapphire Complex September 2, 2017	

Fire Information Line: 406-540-3589
Email: SapphireComplexinfo@gmail.com
Inciweb: https://inciweb.nwcg.gov/incident/5364/
Follow Fire Information on Facebook: Lolo National Forest and Beaverhead-Deerlodge National Forest

Location: Approximately 25 miles south-southeast of Missoula, MT in the Rock Creek drainage
Sapphire Complex: 40,528 acres **Containment:** 53% **Cause:** Lightning **Total Personnel:** 381

Three fires comprise the Sapphire Complex: Little Hogback, Goat Creek, and Sliderock fires. Mike Almas' Northern Rockies Type II Incident Management Team (IMT) is managing the incident. The fires are burning in steep, rocky terrain between the Rock Creek and Upper Willow Creek drainages.

Little Hogback Fire: 31,322 acres, 30% contained.
Friday, firefighters (aided by helicopter support) began performing a burnout operation starting on the ridge between Windlass and Sheep Gulch and continuing between Sheep Gulch and Capron Creek. These challenging burnout operations must be performed methodically, but weather has been cooperative and operations have been successful thus far. Such operations may be critical in securing firelines along the fire's southwest perimeter and protecting structures in that area and will likely continue for one more day. Crews working along the fire's eastern, western, and southern flanks further improved containment and firelines, mopping up hot spots, working inward from the fire perimeter. Structure protection measures (including extensive hoselays) are still in place along Rock Creek Road. Preventing fire growth toward homes and ranches continues to dictate operational priorities, and protection of life is always the primary objective.

Goat Creek Fire: 8,305 acres, 95% contained.
Rehabilitation of firelines and fuel break construction is progressing rapidly, and crews continue to mop up hot spots within the fire's perimeter.

Sliderock Fire: 901 acres, 95% contained.
Crews continue to mop up hotspots and patrol the Sliderock Fire, resulting in increased containment.

Resources Threatened: Private property and structures in the Rock Creek, Upper Willow Creek, and Marshall Creek drainages remain threatened. Other resources threatened include fisheries in Rock Creek, grazing lands along the southern boundary of the Little Hogback Fire, Bonneville Power Administration powerline, and a communication site.

Evacuations: Three structures in the lower end of Capron Creek, near mile marker 33 on Rock Creek Road remain in Level Red- Evacuation Status. Many homes and communities are still potentially threatened by the fires within the Sapphire Complex, and as a result "Yellow" Pre-evacuation status for those areas also remain in effect. See Inciweb maps and evacuation alerts for details.

Closures: The Rock Creek Road from I-90 south to Bitterroot Campground (MP 23.5) is OPEN. Due to fire traffic congestion and fire safety concerns, the Rock Creek Road will continue to be CLOSED from Bitterroot Campground, south to Cornish Gulch (FSR5027), and public traffic is NOT allowed. Upper Willow Creek Road is currently closed to the public. The Beaverhead-Deerlodge National Forest has reduced closure restrictions in the Black Pine ridge area, but maintains all area closures in the Upper Willow Creek, North Fork Lower Willow Creek, and Harvey Creek areas. The Bureau of Land Management has implemented an area closure in the Upper Willow Creek, Ram Mountain, and nearby areas. The Lolo and Beaverhead-Deerlodge National Forests and the Bureau of Land Management have posted closure orders and maps under the closures tab on Inciweb.

Weather: Although winds are predicted to lessen over the fire area today, relative humidities are expected to be very low and temperatures will approach the 90s, which could result in increased fire behavior.

Fire Restrictions: Stage 1 Fire Restrictions are in place on the Beaverhead-Deerlodge National Forest (Forest Service land east of Sandstone Ridge), with the additional modification to prohibit all campfires. Stage 2 Fire Restrictions are in place on BLM, private and state lands in Granite County, and the Lolo National Forest (Forest Service land west of Sandstone Ridge). **For information on fire restrictions, please visit firerestrictions.us.**

Daily Update 8:00 AM	Sapphire Complex September 3, 2017	

Fire Information Line: 406-540-3589
Email: SapphireComplexinfo@gmail.com
Inciweb: https://inciweb.nwcg.gov/incident/5364/
Follow Fire Information on Facebook: Lolo National Forest and Beaverhead-Deerlodge National Forest

Location: Approximately 25 miles south-southeast of Missoula, MT in the Rock Creek drainage
Sapphire Complex: 40,658 acres **Containment:** 53% **Cause:** Lightning **Total Personnel:** 358

Three fires comprise the Sapphire Complex: Little Hogback, Goat Creek, and Sliderock fires. Mike Almas' Northern Rockies Type II Incident Management Team (IMT) is managing the incident. The fires are burning in steep, rocky terrain between the Rock Creek and Upper Willow Creek drainages.

Little Hogback Fire: 31,452 acres, 30% contained.
Saturday, while crews were engaged in challenging burnout operations between Sheep Gulch and Capron Creek, a spot fire occurred due to erratic winds. As a result, firefighters could not successfully complete operations and were forced to fall back and provide point protection along Rock Creek Road. Several retardant drops were performed near the structures along Rock Creek Road and helicopters were used to aid firefighters with suppression in the steep terrain. The spot fire is now well established at more than 700 acres which may not be reflected in the total acreage listed above. Structure protection measures (including extensive hoselays) are still in place along Rock Creek Road. Preventing fire growth toward homes and ranches continues to dictate operational priorities, and protection of life is always the primary objective.

Goat Creek Fire: 8,305 acres, 95% contained.
Rehabilitation of firelines and fuel break construction is progressing rapidly, and crews continue to mop up interior hot spots.

Sliderock Fire: 901 acres, 95% contained.
Crews continue to mop up hotspots and patrol the Sliderock Fire, resulting in increased containment.

Resources Threatened: Private property and structures in the Rock Creek, Upper Willow Creek, and Marshall Creek drainages remain threatened. Other resources threatened include fisheries in Rock Creek, grazing lands along the southern boundary of the Little Hogback Fire, Bonneville Power Administration powerline, and a communication site.

Evacuations: Due to fire activity on the Little Hogback fire and predicted weather conditions, the Granite County Sheriff issued a Level Red-Evacuation Order for some residences along Rock Creek Road, effective Saturday, September 2, at 10:00 p.m. The Level Red- Evacuation Order was issued to residences along both sides of Upper Rock Creek Road and adjacent roads/neighborhoods, beginning from and including Wild Rose Loop south to Stony Creek. Approximately 35 residences will be impacted by the Level Red- Evacuation order. All other Level Yellow-Pre-evacuation notices are still in effect.

Closures: The Rock Creek Road from I-90 south to Bitterroot Campground (MP 23.5) is OPEN. Due to fire traffic congestion and fire safety concerns, the Rock Creek Road will continue to be CLOSED from Bitterroot Campground, south to Cornish Gulch (FSR5027), and public traffic is NOT allowed. Upper Willow Creek Road is currently closed to the public. The Beaverhead-Deerlodge National Forest has reduced closure restrictions in the Black Pine ridge area, but maintains all area closures in the Upper Willow Creek, North Fork Lower Willow Creek, and Harvey Creek areas. The Bureau of Land Management has implemented an area closure in the Upper Willow Creek, Ram Mountain, and nearby areas. The Lolo and Beaverhead-Deerlodge National Forests and the Bureau of Land Management have posted closure orders and maps under the closures tab on Inciweb.

Weather: Hot and very dry conditions persisted Saturday throughout the fire area with temperatures near 90 and relative humidities between 10% and 15%. Winds were out of the west at 12 to 16mph with gusts to 25mph increasing fire activity. Winds and higher temperatures will continue today prompting a red flag warning through Monday.

Fire Restrictions: Stage 1 Fire Restrictions are in place on the Beaverhead-Deerlodge National Forest (Forest Service land east of Sandstone Ridge), with the additional modification to prohibit all campfires. Stage 2 Fire Restrictions are in place on BLM, private and state lands in Granite County, and the Lolo National Forest (Forest Service land west of Sandstone Ridge). **For information on fire restrictions, please visit firerestrictions.us.**

Highline/Goat (acres burned, 9/2)

Highline Fire Update
Payette National Forest

United States Department of Agriculture
500 North Mission Street
McCall, ID 83638

Contact: Mike Ferris, Public Information Officer, 208-559-5367
Date: Saturday, September 2, 2017
For More Information: https://inciweb.nwcg.gov/incident/5500/

Highline Fire Facts

Location: The Highline Fire and Goat Fire are both burning on the Payette National Forest, Krassel Ranger District, entirely within the Frank Church River of No Return Wilderness (https://tinyurl.com/y8qomgpm), approximately 23 miles east/northeast of Warren, Idaho.

Date of Origin: July 28, 21017 @ approx. 7:00 p.m.

Cause: Started by lightning

Current Size: Highline Fire: 45,595 acres / Goat Fire: 405 Acres

Current Situation: The Highline Fire yesterday made several runs up to one mile in length. These occurred on the southern perimeter near Moose and Moose Jaw Creeks and on the eastern perimeter into the Queen Creek drainage area. The fire remains most active on the southern two-thirds of the incident. The western perimeter in Flossie and Chamberlain Creeks continues to back to the west at approximately 1/4 to 1/3 mile per day. On the southern flank, the fire in Moose Creek continues to move to the south after yesterday's run. South of Moose Jaw Creek the fire is well established in heavy timber. This area burned aggressively yesterday afternoon due to stronger winds and will continue to burn well with fire behavior increasing through the weekend because of continuing hot and dry weather. The fire continues to burn actively on the eastern flank in the area of Deer and Queen Creeks. Here the fire is currently moving towards Mule Creek Point out of Queen Creek. Predicted weather conditions through the weekend will support rapid fire growth with possible plume dominated fire behavior on Sunday and Monday. The Goat Fire continued to grow in an old fire scar, moving primarily to the south and west. It did slop over the ridge on the west side and is working its way slowly into Phantom Creek. Firefighters are monitoring the Highline and Goat Fires for impingement of Management Action Points developed in the Strategic Long-Term Plan that may prompt additional point protection at other Values at Risk in the Fire Planning Area. Firefighters continue active point protection efforts at Root Ranch with pumps, hoselays and portable water tanks in place in the event the fire threatens the site. The fire edge is about one and a half miles to the west of Root Ranch, smoldering in the bottom of Wapiti Creek. Fire progression towards additional Management Action Points and Values at Risk including Sheepeater Lookout, Butts Point Lookout, Snowshoe Mine, and Fern Creek Cabin, as well as priority areas along the Salmon River Corridor between Lantz Bar and Corn Creek Boat Launch and Campground will be monitored. Fire movement north and east towards Arctic Point Lookout and south and west towards Rock Rabbit Lookout has increased point protection actions. Firefighters are planning to implement structure wrap at the Arctic Point Lookout today. Continued fire progression west towards Sheepeater Lookout will be closely monitored to determine timing and needs of unstaffing the Lookout and implementing structure protection measures. Chamberlain Guard Station and Stonebraker are in patrol status by air.

Percent Containment: The Highline and Goat Fires have no current containment. They are lightning-caused, natural fires burning in the Frank Church River of No Return Wilderness. Firefighters are conducting point protection which is a wildfire response strategy that protects specific assets or highly valued resources from the wildfire without directly halting the continued spread of the wildfire. Points or zones being protected may be communities, individual structures, areas of high resource value, etc. Continued wildfire spread may be desirable in order to achieve management objectives or may be inevitable due to extreme burning conditions, safety concerns to firefighter exposure, inaccessible terrain, or other limitations.

Highline Fire Update
Payette National Forest

United States Department of Agriculture
500 North Mission Street
McCall, ID 83638

Contact: Mike Ferris, Public Information Officer, 208-559-5367
Date: Sunday, September 3, 2017
For More Information: https://inciweb.nwcg.gov/incident/5500/

Highline Fire Facts

Location: The Highline Fire and Goat Fire are both burning on the Payette National Forest, Krassel Ranger District, entirely within the Frank Church River of No Return Wilderness (https://tinyurl.com/y8qomgpm), approximately 23 miles east/northeast of Warren, Idaho.

Date of Origin: July 28, 21017 @ approx. 7:00 p.m.

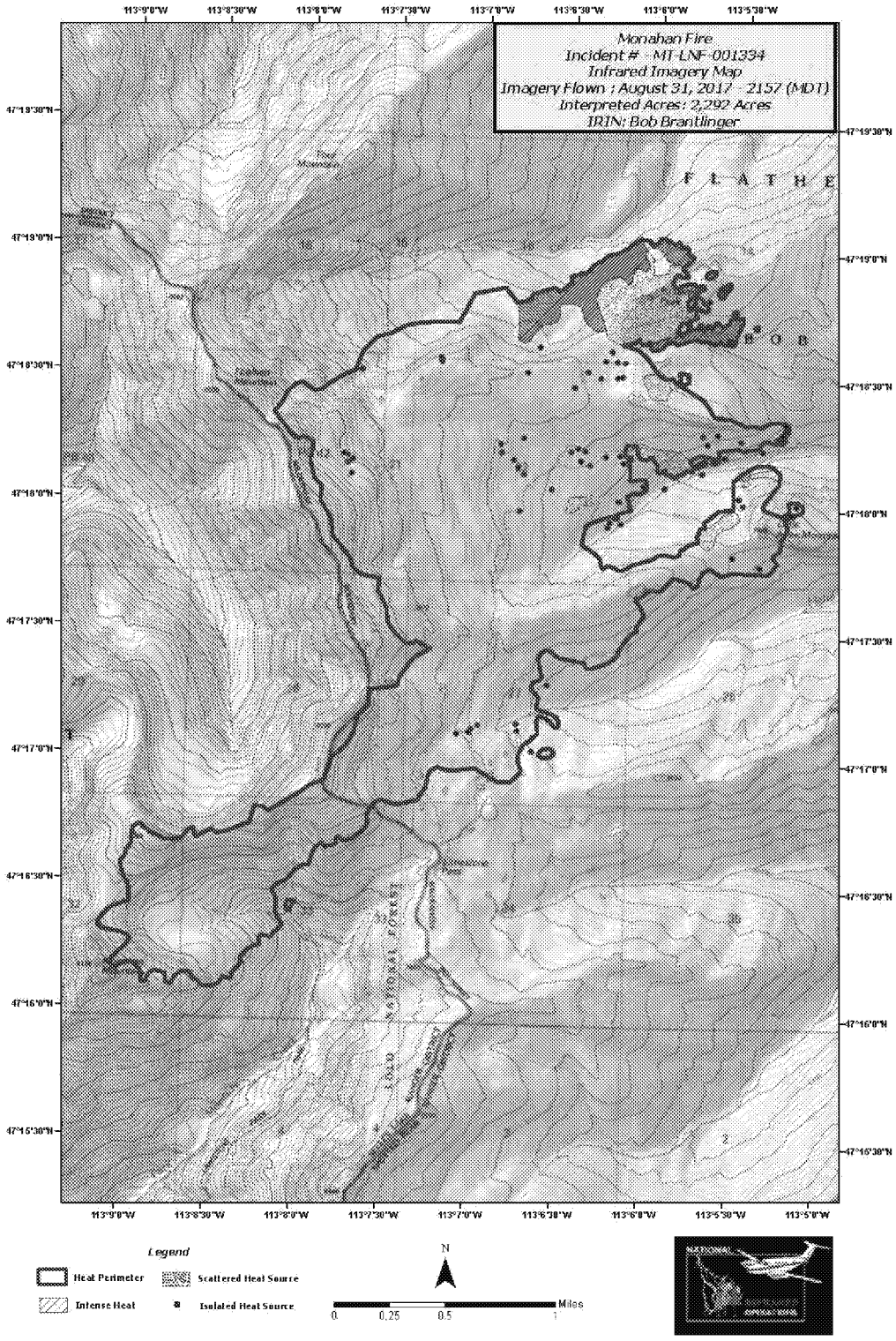
Cause: Started by lightning

Current Size: Highline Fire: 52,182 acres / Goat Fire: 467 Acres

Current Situation: The Highline fire behavior and growth for the day is indicative of the forecasted high temperatures and high Haines indices. The fire is continuing to spread through backing, active flanking and crown fire in areas with closed canopies in alignment with the wind. Other areas are having occasional torching as areas of heavy concentrated fuels heat up during the burn period. The southern portion of the fire is most active, while the northern portion remains in a fairly stable state. The fire is actively burning to the south, west and east. The weather conditions support the continued growth of the fire in all directions. Fire activity continues in the Queen and Deer Creek drainages to the east as the fire makes an up-slope run towards Mule Creek Point. South of Moose Jaw Creek, the fire is actively burning with fire moving east/southeast towards the headwaters of McCalla Creek. From Moose Creek, the fire is increasing in activity as it moves south towards upper Lodgepole Meadows. In the areas of Game and Flossie Creeks the fire continues to back to the west. Active fire behavior will continue through Monday evening due to predicted temperatures 10 to 15 degrees above normal and Haines indices between 5 and 6. The Goat Fire continues growing to the south and west in an old fire scar and has not crossed Canyon Creek. A **RED FLAG Warning** is in effect from Sunday through 10:00 p.m. Monday due to elevated atmospheric instability. A strong upper level ridge is building and will be in place through the Labor Day weekend. Firefighters continue active point protection efforts at Root Ranch with pumps, hoselays and portable water tanks in place in the event the fire threatens the site. The fire edge is about one and a half miles to the west of Root Ranch, smoldering in the bottom of Wapiti Creek. Fire progression towards additional Management Action Points and Values at Risk including Sheepeater Lookout, Butts Point Lookout, Snowshoe Mine, and Fern Creek Cabin, as well as priority areas along the Salmon River Corridor between Lantz Bar and Corn Creek Boat Launch and Campground, will be monitored. Fire movement north and east towards Arctic Point Lookout, and south and west towards Rock Rabbit Lookout, has increased point protection actions. Firefighters completed structure wrap at the Arctic Point Lookout yesterday and have plans to wrap Rock Rabbit Lookout today. Continued fire progression west towards Sheepeater Lookout will be closely monitored to determine timing and needs of unstaffing the Lookout and implementing structure protection measures. Chamberlain Guard Station and Stonebraker are in patrol status by air.

Percent Containment: The Highline and Goat Fires have no current containment. They are lightning-caused, natural fires burning in the Frank Church River of No Return Wilderness. Firefighters are conducting point protection which is a wildfire response strategy that protects specific assets or highly valued resources from the wildfire without directly halting the continued spread of the wildfire. Points or zones being protected may be communities, individual structures, areas of high resource value, etc. Continued wildfire spread may be desirable in order to achieve management objectives or may be inevitable due to extreme burning conditions, safety concerns to firefighter exposure, inaccessible terrain, or other limitations.

Monahan (acres burned, 9/2)



Flathead Area Interagency Fire Information

Fire Name	Date Started	Size in Acres	Cause	Status
Soakem - Spotted Bear Ranger District, Great Bear Wilderness, Soakem Mt.	August 30	1.5	Lightning	Monitor strategy
Strawberry – Spotted Bear RD, Bob Marshall Wilderness, NW of Sabido Cabin https://inciweb.nwcg.gov/incident/5574/#	August 25	747	Lightning	Monitor strategy
Scalp – Spotted Bear RD, Bob Marshall Wilderness near Bow Mtn. https://inciweb.nwcg.gov/incident/5520/#	August 15	3,109	Lightning	Monitor strategy
Dolly Varden – Located in the Great Bear Wilderness, SE of Schafer Meadows https://inciweb.nwcg.gov/incident/5519/#	August 15	185	Lightning	Monitor strategy
Reef – Located in the Bob Marshall Wilderness near Count Peak https://inciweb.nwcg.gov/incident/5525/	August 13	891	Lightning	Monitor strategy
Cyclone Lake, Glacier View RD	August 12	36	Lightning	Contained
Monahan, Spotted Bear RD https://inciweb.nwcg.gov/incident/5401/#	July 16	1,939 FNF 353 LNF (2,292 total)	Lightning	Monitor Strategy

MT Department of Natural Resources and Conservation

Fire Name	Date Started	Size in Acres	Cause	Status
Elbow Creek, Kalispell Unit	August 30	.1	Lightning	Contained, 8/31
West Dayton, Kalispell Unit	August 30	.2	Lightning	Patrol status, 8/31
Cottonwood, Kalispell Unit	August 22	.1	Unknown	Patrol status, 8/22
Tamarack Fire, Libby Unit	August 12	407	Lightning	Transitioned back to Libby Unit, DNRC 8/28 Mop up continues...

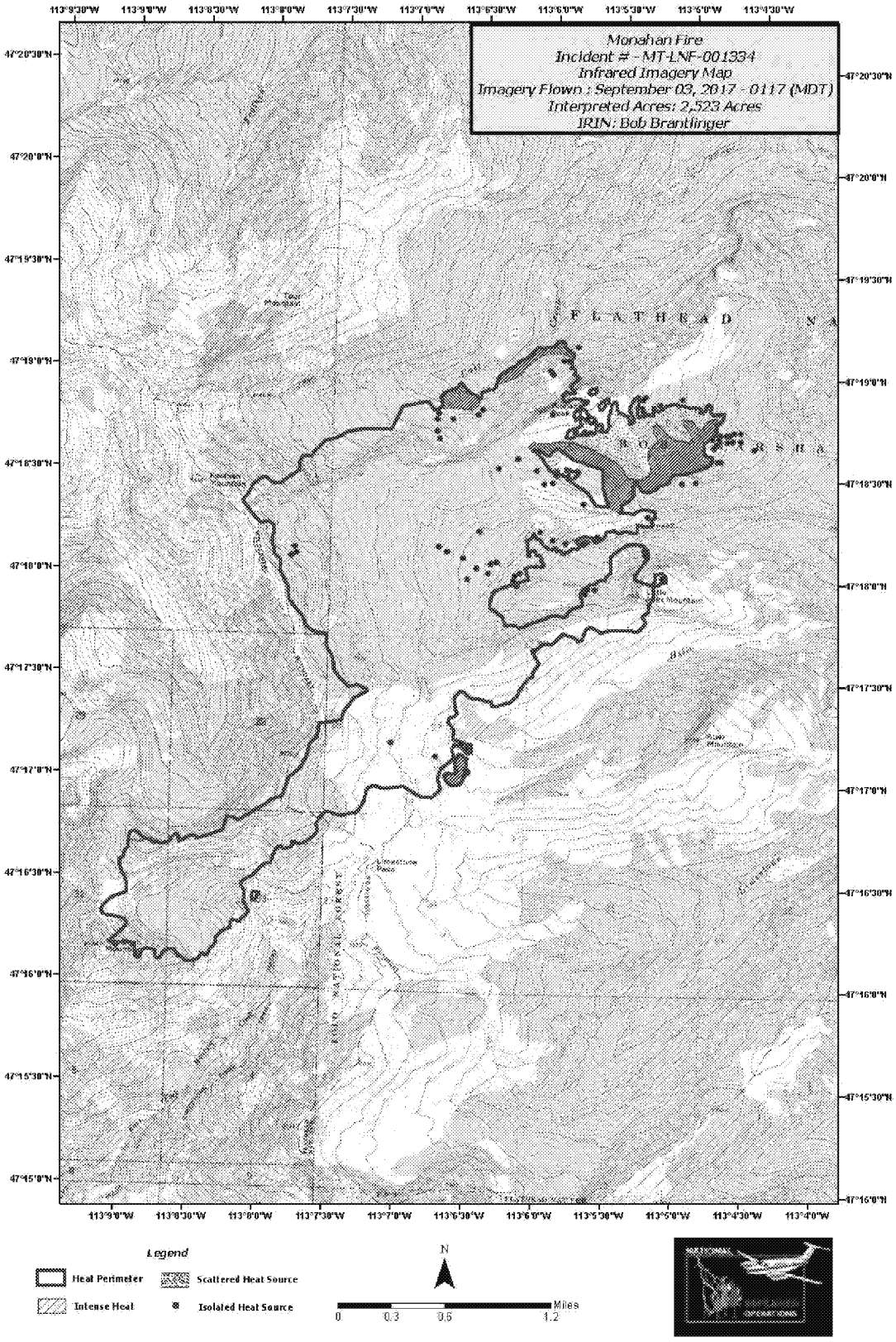
Glacier National Park

Fire Name	Date Started	Size in Acres	Cause	Status
Kishenehn	August 30	2.0	Lightning	Personnel on scene
Kintla Trail	August 16	.1	Lightning	Controlled

U.S. Department of Interior — National Park Service
U.S. Department of Agriculture — Forest Service
Montana — County Fire Wardens Association
Flathead County Montana — Office of Emergency Services
State of Montana — Department of Natural Resources and Conservation

Flathead National Forest Facebook post, 9/2/17, 1:28pm MST

(source: https://www.facebook.com/discovertheflathead/)


Monahan Fire
Incident # - MT-LNF-001334
Infrared Imagery Map
Imagery Flown : September 03, 2017 - 0117 (MDT)
Interpreted Acres: 2,523 Acres
IRIN: Bob Brantlinger
Legend
Heat Perimeter
Scattered Heat Source
Intense Heat
Isolated Heat Source
N
Miles
0
0.3
0.6
1.2

Hidden (acres burned, 9/2)

Note: detailed information on the Hidden Fire was only available at sporadic times during the episode in question. In order to estimate the number of acres burned on 9/2, the total acres burned from 8/31-9/4 was distributed evenly per day. With 2,426 acres burned during that 4-day period, the estimated area burned on 9/2 was 606 acres.

Nez Perce-Clearwater National Forests Fire Update - August 31

Kamiah, Idaho (August 31, 2017) – Lightning activity across the Nez Perce-Clearwater National Forests Wednesday resulted in numerous new fires and reports of new fires. Staffed lookouts and aerial reconnaissance will be busy today as they attempt to identify new starts. With resources stretched, fire managers are tasked with prioritizing placement of personnel and equipment. For instance, a district that received no lightning activity will be asked to share firefighters, engines, and so on, with districts that have or expect to have more initial response activity.

Stage 1 fire restrictions are in effect in the Grangeville Fire Restrictions Area, Riverbreaks, Hells Canyon National Recreation Area, and Uplands. The restrictions do not include wilderness areas. Visitors should know before you go: fire and closure information is posted on the Nez Perce-Clearwater National Forests website at www.fs.usda.gov/nezperceclearwater. Information on fire restrictions across the state is located at http://www.idahofireinfo.com/.

Forest and Fire Management Staff considered the long-term effects of smoke in their decision to manage fires in the wilderness and roadless areas. Fire managers are working with air quality specialists to monitor smoke and potential impacts to communities. For current air quality in Idaho, please visit http://www.deq.idaho.gov/air-quality/burning/current-wildfire-smoke-info/ and for Montana http://svc.mt.gov/deq/todaysair/smokereport/mostrecentupdate.aspx .

Current status by district:

Salmon River Ranger District

Wednesday the Hanover fire (20,221 acres) had some increased fire activity on the north side where it pushed to Umbrella Butte, but favorable winds kept it moving into the wilderness. Activity on the northwest side of the fire into Boulder Creek was minimal. The west and south edges of the fire were quiet Thursday, and activity remains west of Sheep Creek on the east side This fire is being

heavily patrolled and containment lines actively monitored. Two 20-person crews, three engines, a type 3 and a type 2 helicopter, and various pieces of heavy equipment remain assigned to the incident. Information for the Hanover fire is available at https://inciweb.nwcg.gov/incident/5459/.

Three new fires have been staffed: the Center Ridge fire (approx. 250 acres), the Johnson Ridge fire (1 acre), and the Squaw fire (.25 acre) two miles northeast of Bald Mountain. Firefighters are working to suppress the fires, supported by aerial water drops. Reports of additional fires are being investigated.

For more information on fire activity or closures on Salmon River Ranger District, please call (208) 839-2211.

Lochsa/Powell Ranger District

The Andys Hump fire (estimated 70-80 acres), 4 miles east of Coolwater Lookout, is burning in timber and brush on the north and south sides of Coolwater Ridge. The Glover fire (25-30 acres), 3.5 miles east of Coolwater Lookout, is burning slowly north-northeast. A closure order is in effect for a portion of the Eagle Mountain Trail #206 and one is expected for a segment of Road #317 in the vicinity of the Coolwater Lookout. The Old Man fire (25-30acres), one mile east of Old Man Point in the Selway-Bitterroot Wilderness, is moving downhill in brush. All of these fires are being managed for resource benefit, utilizing point protection strategies. For information on these fires, please call the Kooskia office at (208) 926-4274.

An additional closure order has been implemented for approximately two miles of Packers Meadow Road #373 from the Idaho/Montana border. Crews assigned to the Lolo Peak fire will continue to patrol and monitor the area of an earlier burnout.

Fire activity was moderated Wednesday on the Hidden fire (approx. 7,909 acres), at Hidden Lake in the Selway-Bitterroot Wilderness, due to an inversion over the area most of the day. Winds produced by afternoon thunderstorms did not hit the fire area. The fire remains approximately one-half mile from the Idaho/Montana boundary. Trail closures remain in effect for the safety and protection of the public. Smoke is expected to impact the local area as well as the Bitterroot and Missoula Valleys. For information on the Hidden fire or closures, please call the Powell office at (208) 942-3113.
(source: http://idahofireinfo.com)

Nez Perce-Clearwater National Forests Fire Update - September 2

Kamiah, Idaho (September 2, 2017) – The Nez Perce-Clearwater National Forests firefighting resources continue to respond to new fire starts following Wednesday's storm. Twenty-six lightning-caused starts have been detected with the largest of those being the Center Ridge fire, estimated to be 250 acres, with crews continuing mop up and patrol of the fire. Like many areas across the west and northwest, resources are being shared to protect values at risk. As above average temperatures continue and no precipitation is expected recreationists are reminded to use caution with any device that could cause a spark.

Stage 1 fire restrictions are in effect in the Grangeville Fire Restrictions Area, Riverbreaks, Hells Canyon National Recreation Area, and Uplands. The restrictions do not include wilderness areas. Visitors should know before you go: fire and closure information is posted on the Nez Perce-Clearwater National Forests website at www.fs.usda.gov/nezperceclearwater. Information on fire restrictions across the state is located at http://www.idahofireinfo.com/.

Forest and Fire Management Staff considered the long-term effects of smoke in their decision to manage fires in the wilderness and roadless areas. Fire managers are working with air quality specialists to monitor smoke and potential impacts to communities. For current air quality in Idaho, please visit http://www.deq.idaho.gov/air-quality/burning/current-wildfire-smoke-info/ and for Montana http://svc.mt.gov/deq/todaysair/smokereport/mostrecentupdate.aspx .

Current status by district:

Salmon River Ranger District

The Hanover fire (21,041 acres) shows minimal growth on the north-northwest side of Marten Hill as well as in the area of Black Butte. It remains west of Sheep Creek. Helicopters are ready for water drops in the event fire activity increases significantly. This fire is being heavily patrolled and containment lines actively monitored. Two 20-person crews, three engines, a type 3 and a type 2 helicopter, and various pieces of heavy equipment remain assigned to the incident. Information for the Hanover fire is available at https://inciweb.nwcg.gov/incident/5459/.

The Center Ridge fire is contained at 250 acres; the Cougar fire is controlled at 0.5 acre; the Square fire is contained at .25 acre; the Meadow Creek fire is contained at .75 acre, and the Hungry and Johnson Ridge fires are out.

For more information on fire activity or closures on Salmon River Ranger District, please call (208) 839-2211.

Lochsa/Powell Ranger District

Reported Friday, the Little Weitas fire (.1 acre), is burning in heavy timber 0.75 miles north of Little Weitas Butte. The fire is being managed for resource benefits as it performs its natural role on the landscape.

The Liz Butte Fire (5.5 acres), 0.5 miles north of the Liz Butte cabin, is burning in dead and down timber and brush. The fire is staffed and firefighters are assessing the Liz Butte cabin for structure protection. Andys Hump fire (100 acres), 2 miles east of Coolwater Lookout, is burning on the north and south sides of Coolwater Ridge. Structure protection measures are in place on the Coolwater Lookout. Road and trail closures are in effect for the south side of the fire on the Moose Creek Ranger District. Air patrol has been unable to provide details for the Glover fire (25-30 acres), 3.5 miles east of Coolwater Lookout, but a closure order is in effect for a portion of the Eagle Mountain Trail #206 to the south of the fire. No new information is available for the Old Man fire (25-30 acres) one mile southwest of Huckleberry Butte in the Selway-Bitterroot Wilderness. A portion of the Idaho Centennial Trail #220 to the north of the fire is closed for public safety. All of these fires are being managed for resource benefit, utilizing point protection strategies. They are being monitored and patrolled by air and ground resources. For information on these fires, please call the Kooskia office at (208) 926-4274.

The Hidden fire, at Hidden Lake in the Selway-Bitterroot Wilderness, has grown to 8,497 acres. The active portion of the fire continues to be on the west end, south of the confluence of Big Sand and Colt Killed Creeks. No new growth was observed on the east end near the Montana/Idaho border. The fire remains approximately one-half mile from the border. Trail closures remain in effect for the safety and protection of the public. Smoke is expected to impact the local area as well as the Bitterroot and Missoula Valleys. For information on the Hidden fire or closures, please call the Powell office at (208) 942-3113.
(source: http://idahofireinfo.com)

Nez Perce-Clearwater National Forests Fire Update - Sept. 4

Kamiah, Idaho (September 4, 2017) – Potential for extreme fire behavior on many of the fires exists under the current weather conditions. In the interest of public safety and protection, many trails, some roads and a few areas are closed because of fire activity on the Nez Perce-Clearwater National Forests. For full details and maps, please visit the forest website atwww.fs.usda.gov/alerts/nezperceclearwater/alerts-notices.

Stage 1 fire restrictions are in effect in the Grangeville Fire Restrictions Area, Riverbreaks, Hells Canyon National Recreation Area, and Uplands. The restrictions do not include wilderness areas. Information on fire restrictions across the state is located at http://www.idahofireinfo.com/.

Forest and Fire Management Staff considered the long-term effects of smoke in their decision to manage fires in the wilderness and roadless areas. Fire managers are working with air quality specialists to monitor smoke and potential impacts to communities. For current air quality in Idaho, please visit http://www.deq.idaho.gov/air-quality/burning/current-wildfire-smoke-info/ and for Montana http://svc.mt.gov/deq/todaysair/smokereport/mostrecentupdate.aspx .

Current status by district:

Salmon River Ranger District

The Hanover fire (23,333 acres) grew somewhat in upper Boulder Creek north of Marten Hill. The fire is holding in the Sheep Creek drainage and continues backing into Porcupine Creek. If conditions permit, the incident commander intends to make aerial reconnaissance of the fire today. It is being heavily patrolled and containment lines actively monitored. Two 20-person crews, three engines, a type 3 and a type 2 helicopter, and various pieces of heavy equipment remain assigned to the incident. Information for the Hanover fire is available athttps://inciweb.nwcg.gov/incident/5459/.

The Center Ridge fire (250 acres) is staffed by seven personnel and an engine with the expectation that it will be controlled today. The Square fire (.25 acre) is out.

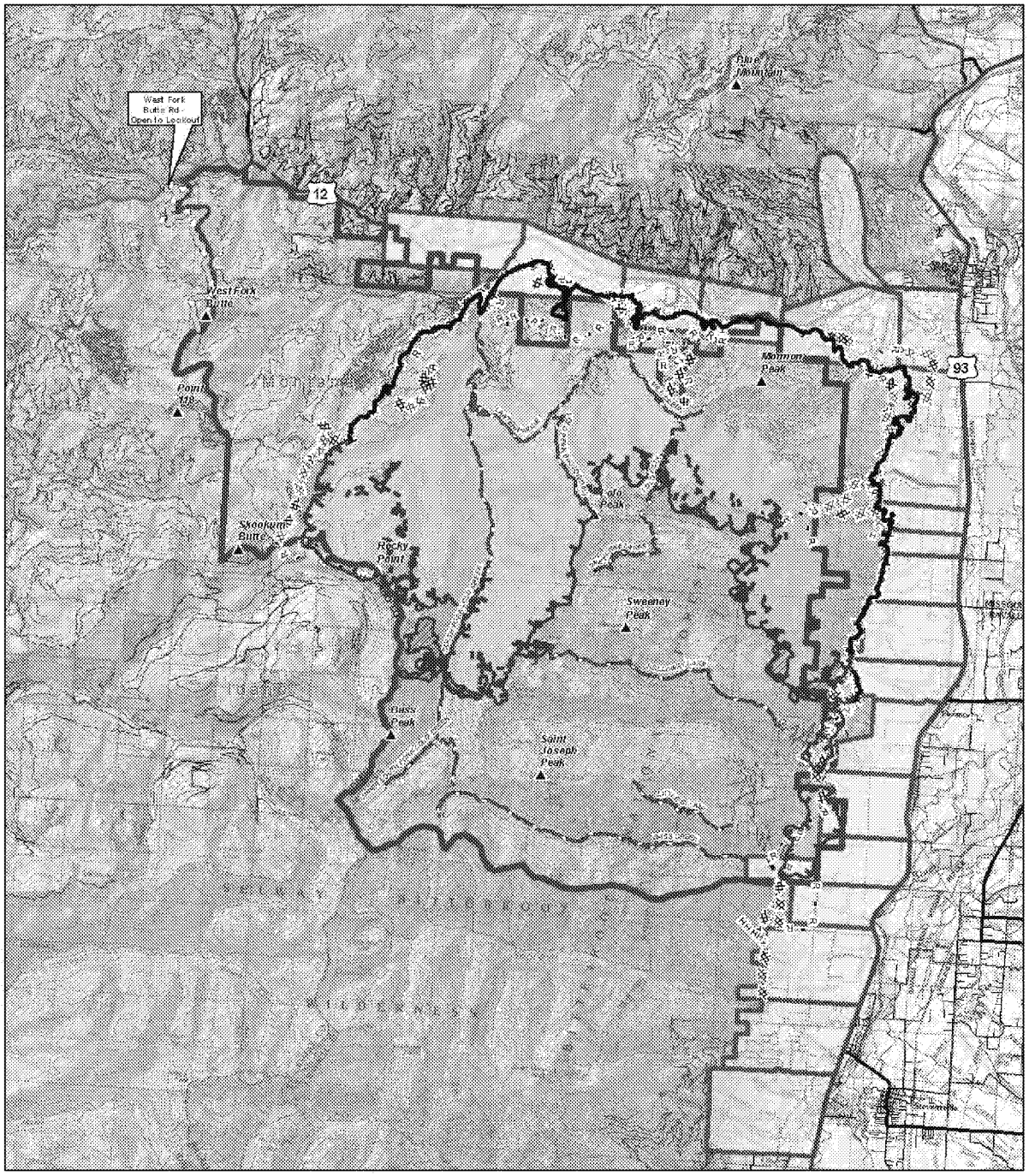
For more information on fire activity or closures on Salmon River Ranger District, please call (208) 839-2211.

Lochsa/Powell Ranger District

Andys Hump fire (330 acres), 2 miles east of Coolwater Lookout, is burning on the north and south sides of Coolwater Ridge, on the Lochsa/Powell and Moose Creek Ranger Districts. Structure protection measures are in place on the Coolwater Lookout. This fire is being managed for resource benefits, utilizing point protection strategies. The Glover fire (approx. 100 aces) is burning 3.5 miles east of Coolwater Lookout. The Little Weitas fire (approx. 30 acres) is burning in heavy timber 0.75 miles north of Little Weitas Butte. The Liz Butte fire (approx. 80 acres), 0.5 miles north of the Liz Butte cabin, is staffed and structure protection measures continue for the cabin. If conditions permit, aerial reconnaissance will occur today. Liz Butte Road 560 is closed to the cabin. The Old Man fire (approx. 650 acres) is one mile southwest of Huckleberry Butte in the Selway-Bitterroot Wilderness. All of these fires are being managed for resource benefit, utilizing point protection strategies. They are being monitored and patrolled by air and ground resources. Various trail and road closures are in effectfor the safety and protection of the public. For information on these fires and closures, please call the Kooskia office at (208) 926-4274.

The Hidden fire, at Hidden Lake in the Selway-Bitterroot Wilderness, has grown to 10,335 acres. It was active on both the east and west Sunday, with continued growth south of the confluence of Colt Killed and Big Sand Creeks and within the Big Flat Creek drainage. Infrared imagery shows two spot fires crossed the Idaho/Montana border into the Fred Burr Creek drainage on the Bitterroot National Forest, within 500 feet of the border. If conditions allow, helicopter water drops on the spots may occur today. Trail closures remain in effect for the safety and protection of the public. Smoke is expected to impact the local area as well as the Bitterroot and Missoula Valleys. For information on the Hidden fire or closures, please call the Powell office at (208) 942-3113.
(source: http://idahofireinfo.com)

Lolo Peak (acres burned, 9/2)



Lolo Peak Fire
Public Information Map
MT-LNF-001288
September 02, 2017
42,687 Acres

0 1 2 4 Miles

Fire perimeter as of 09/02/2017 @ 0002 hrs

Completed Dozer Line
Completed Hand Line
Road as Completed Line
Planned Fire Line
West Fork Butte Rd - Open to Lookout
IR Intense Heat
Closure Area
EvacuationZones
Evacuation Warning
Road Closure
Trail Closures
Temporary Flight Restriction - Includes Unmanned Aerial Vehicles (Drones)
Fire Perimeter
Forest Service
Highways
County Roads
Forest Roads
Other Roads

Lolo Peak Fire
Public Information Map

MT-LNF-001288
September 03, 2017
45,012 Acres

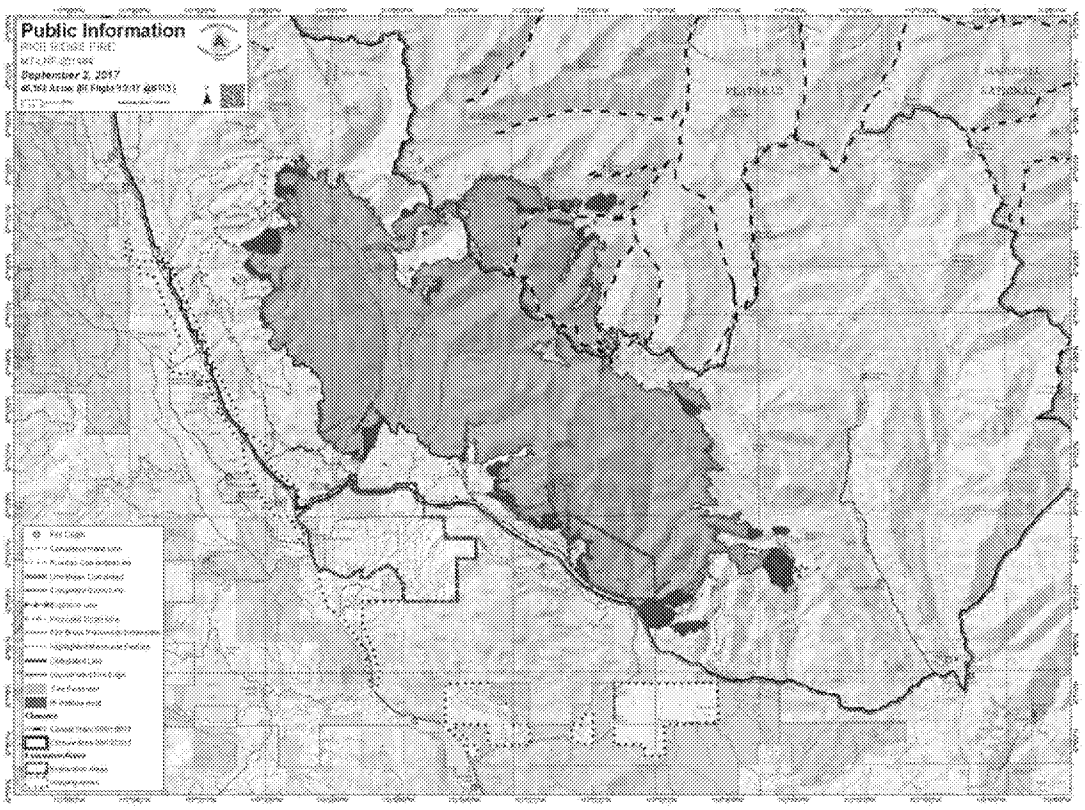
0 1 2 4 Miles

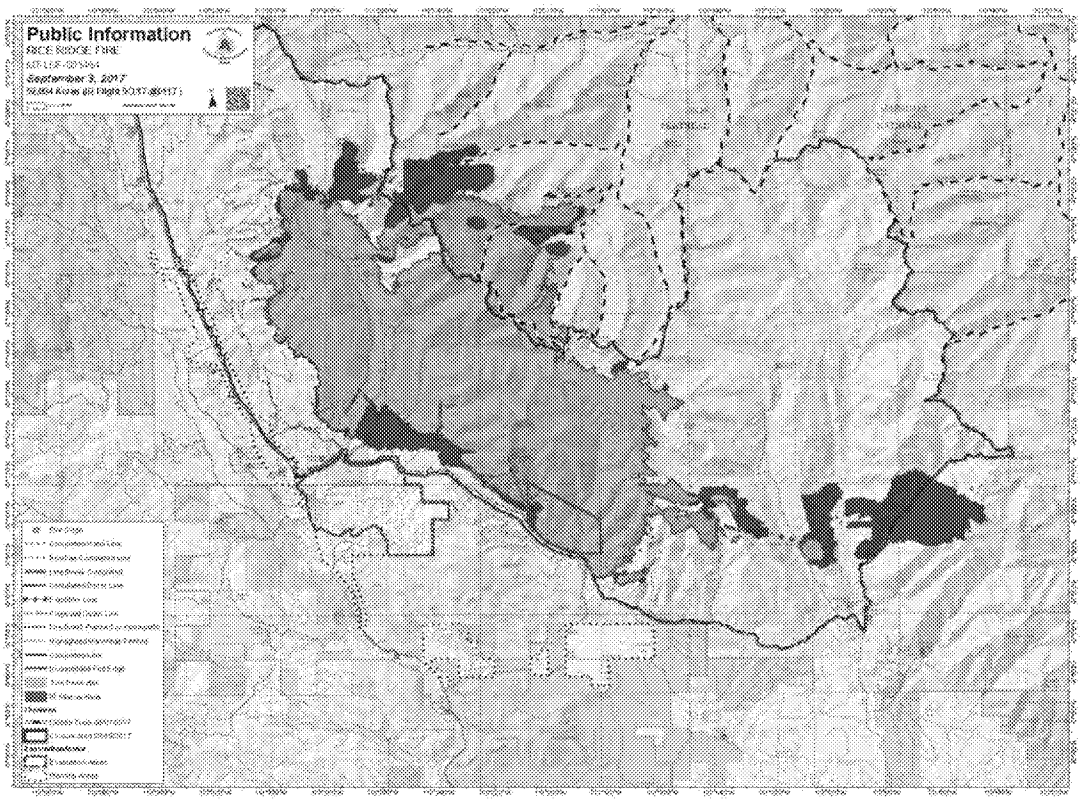
IR data from 9/02/2017 at 2128 hrs.

- IR Isolated Heat Sources
- IR Intense Heat
- IR Scattered Heat

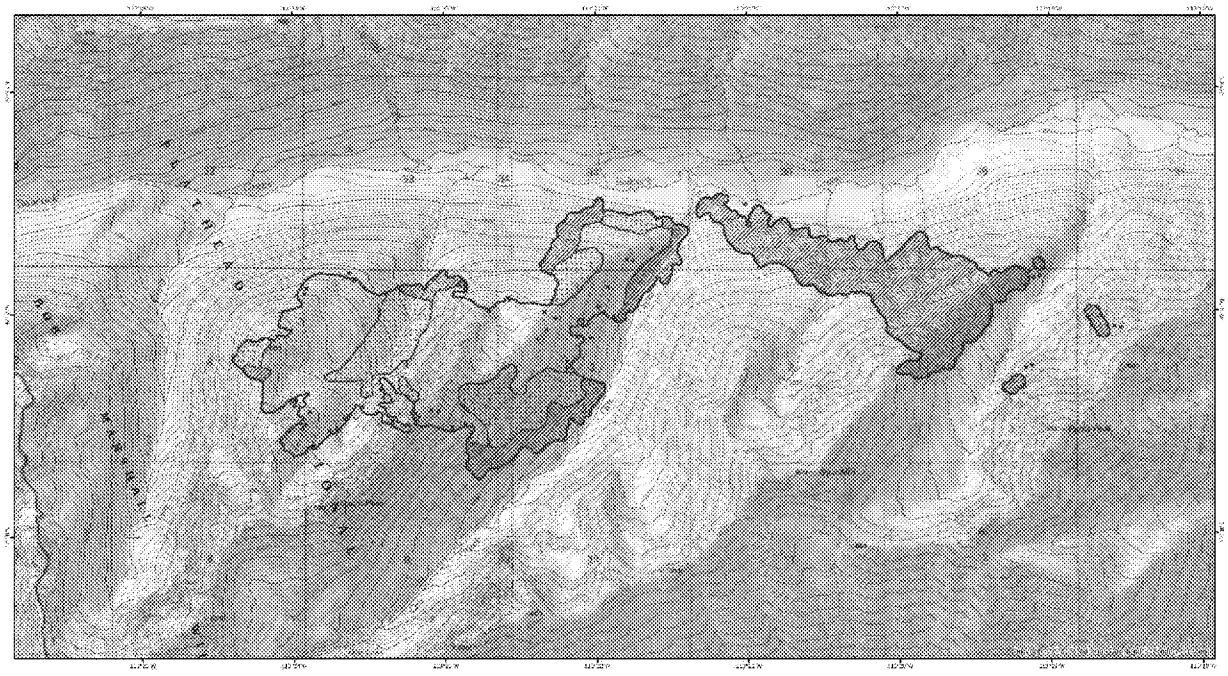
- Completed Dozer Line
- Completed Hand Line
- Road as Completed Line
- Planned Fire Line
- Structures
- West Fork Butte Rd - Open to Lookout
- Evacuation Zone
- Evacuation Warning
- Closure Area
- Road Closure
- Trail Closures
- Temporary Flight Restriction - Includes Unmanned Aerial Vehicles (Drones)
- Fire Perimeter
- Forest Service

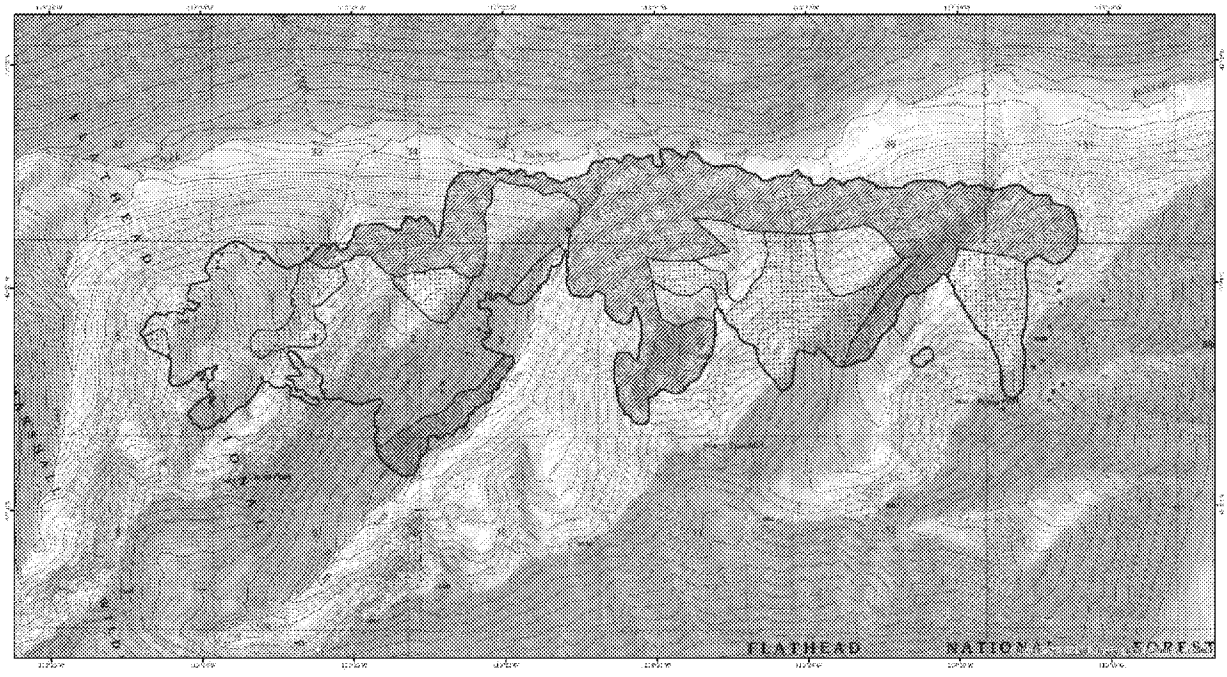
Rice Ridge (acres burned, 9/2)



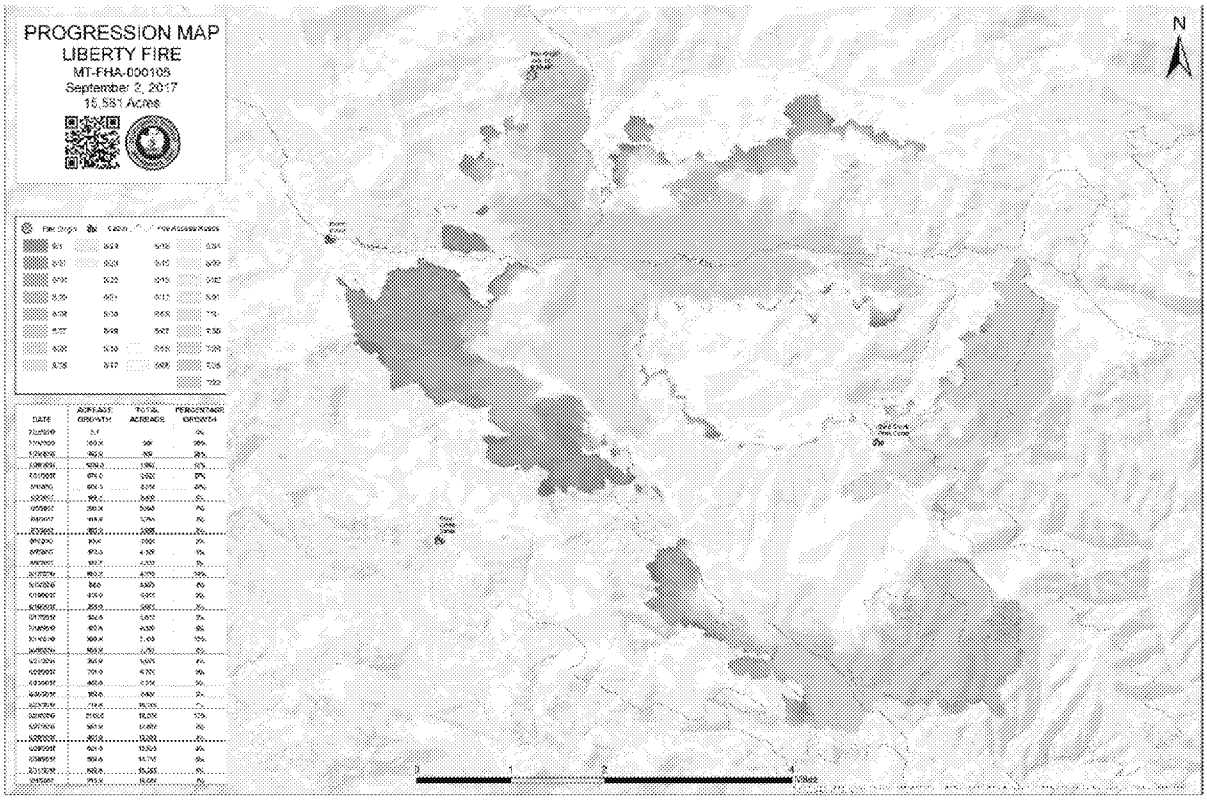


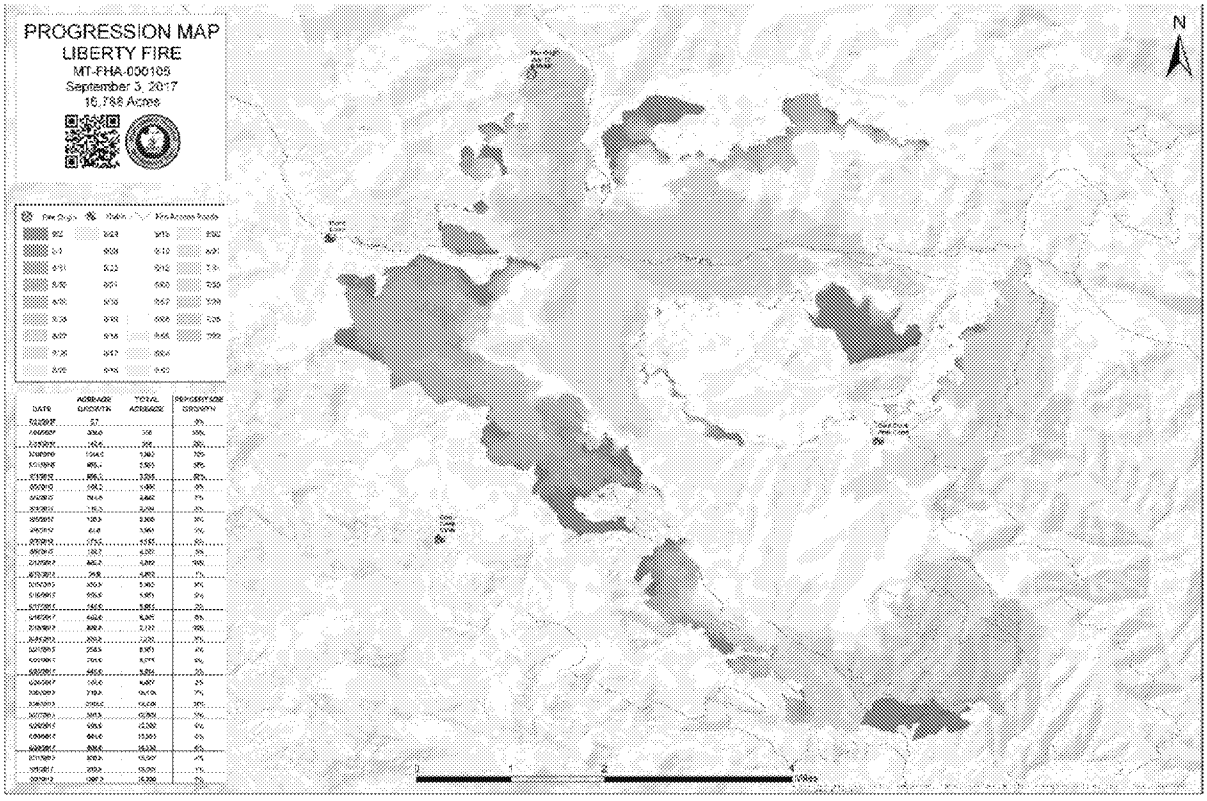
Reef (acres burned, 9/2)





Liberty (acres burned, 9/2)





Hanover (acres burned, 9/2)

InciWeb - Incident Information System

Hanover Fire News Release

Hanover Fire Update - September 2

Incident: Hanover Fire Wildfire
Released: 9/2/2017

The Hanover fire (21,041 acres) shows minimal growth on the north-northwest side of Marten Hill as well as in the area of Black Butte. It remains west of Sheep Creek. Helicopters are ready for water drops in the event fire activity increases significantly. This fire is being heavily patrolled and containment lines actively monitored. Two 20-person crews, three engines, a type 3 and a type 2 helicopter, and various pieces of heavy equipment remain assigned to the incident.

Content posted to this website is for information purposes only.

InciWeb - Incident Information System

Hanover Fire News Release

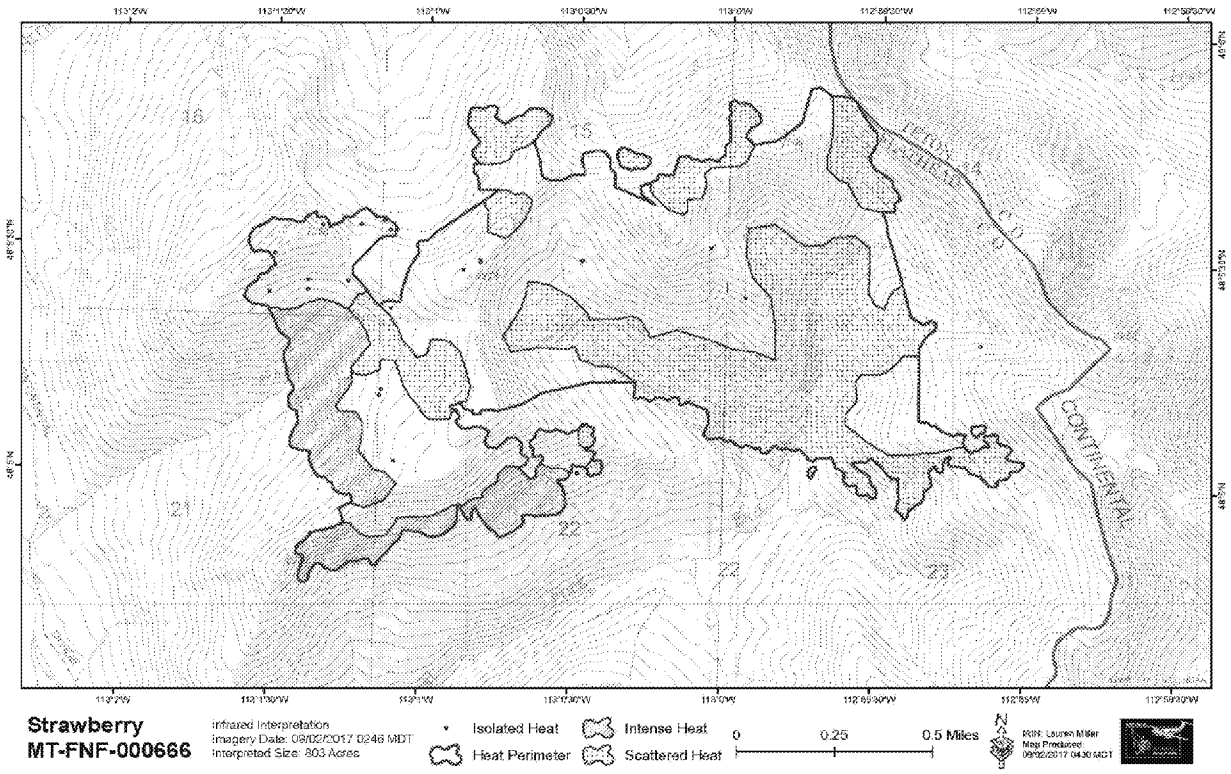
Hanover Fire Update - Sept. 3

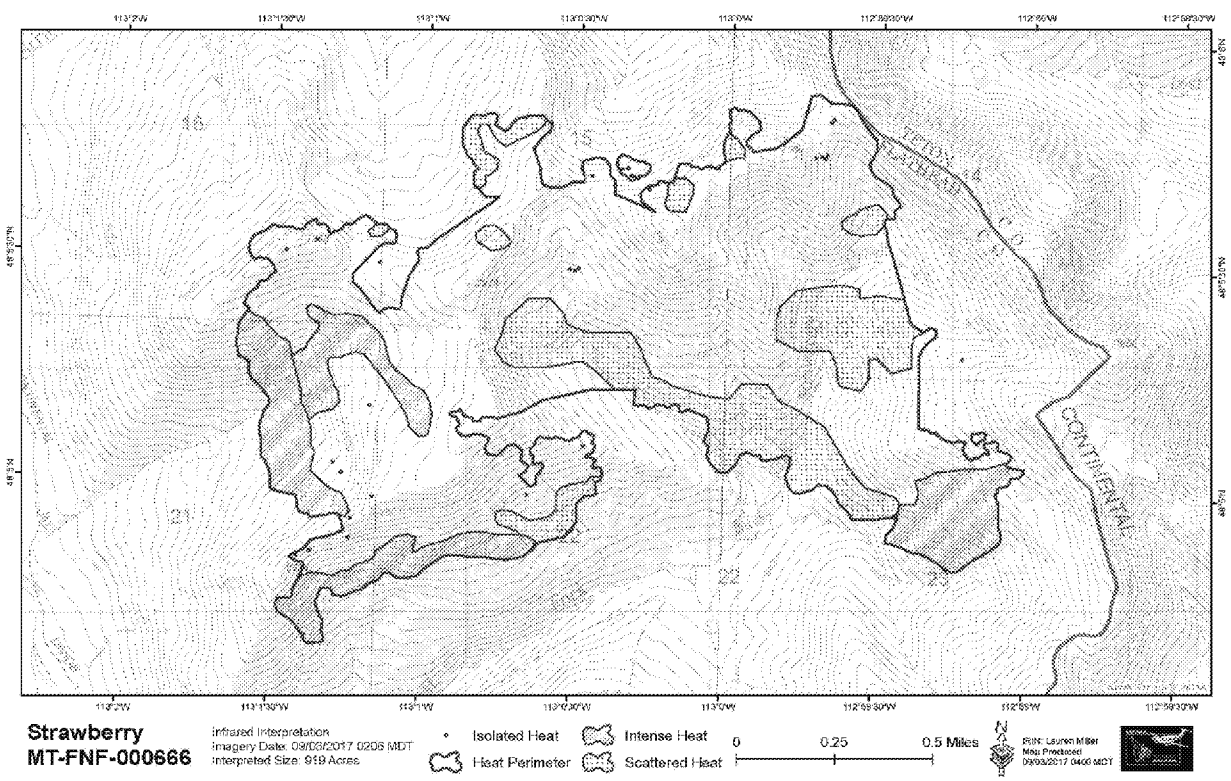
Incident: Hanover Fire Wildfire
Released: 9/3/2017

The Hanover fire (22,289 acres) continued burning in the upper reaches of Boulder Creek north of Marten Hill and at Umbrella Butte. Generally, the south and west sides of the fire are quiet. The fire is holding in the Sheep Creek drainage and backing into Porcupine Creek, with some activity near Black Butte. This fire is being heavily patrolled and containment lines actively monitored. Two 20-person crews, three engines, a type 3 and a type 2 helicopter, and various pieces of heavy equipment remain assigned to the incident.

Content posted to this website is for information purposes only.

Strawberry (acres burned, 9/2)





Highway 200 Complex (acres burned, 9/2)

Kootenai National Forest Fire Update for September 2, 2017
Release Date: Sep 2, 2017
Contact(s): Willie Sykes

LIBBY, Mont. September 2, 2017 - This is the September 2 fire update of the fires that are burning actively on the Kootenai National Forest. The Gibralter, Caribou, West Fork, and Highway 200 Complex fires are detailed below. Personnel, equipment and other resources are on the scene at these fires and other resources are on order to respond to the fires.
Fire growth on the Gibralter Ridge Fire is minimal and crews will continue to mop-up, patrol and monitor the west, south and east sides of the fire. Pre-evacuation warnings and closure orders are in place in the vicinity of the fire areas.
The Caribou Fire, now estimated at 6,781 acres, has continued burning east toward Road 303 and another active fire day is expected. Crews and heavy equipment along Road 303 are on the scene to provide structure protection and residents can expect to see fire personnel in the area. Pre-evacuation warnings have been issued for all areas in West Kootenai as of 7:00 p.m. on September 1.
Structures are threatened and structure protection assessments will commence today for West Kootenai starting in the Spring Creek area. Fire managers will continue to coordinate with Canadian fire managers on fire protocol. There will be a community meeting to discuss the Caribou Fire today, September 2 at 7:30 p.m. in the community of West Kootenai on the Kootenai store deck.
The West Fork Fire, estimated at 900 acres, is located in the Quartz Creek and Bobtail Ridge area on the Libby Ranger District. The fire is experiencing spotting and active fire behavior and with the windy conditions expect to see smoke in the air. The Lincoln County Sheriff's Office is requesting the public to avoid the Kootenai River Road, Quartz Creek Road, Bobtail Road and Bobtail Cutoff areas to facilitate safe fire response and public safety. A Type III team is in place to provide fire suppression and will collaborate with Lincoln County and the Lincoln County Sheriff's Office to provide a coordinated fire response. Pre-evacuation warnings have been issued for residents in the upper end of Bobtail Road north of Bobtail Cutoff, including Horton Drive.

ED_002666_00009483-00206

The Highway 200 Complex, now estimated 828 acres, includes the Readers Fires, Miller Fire, Moose Peak Fire and the Cub Fire on the Cabinet Ranger District and Deep Creek and Sheep gap Fires on the Plains-Thompson Falls Ranger District on the Lolo National Forest. A closure order is in place in the vicinity of the Reader and Cub fires. Pre-evacuation notices have been issued to some residents along the East Fisher Road. A Type II Team led by Rick Connell is in charge of the fire and will assume command tonight, September 2.
Windy, warmer and dryer weather will persist through the weekend. Stage II Fire Restrictions are in effect for Lincoln County and Kootenai National Forest due to extreme fire danger. Current fire conditions can be found at www.firerestrictions.us. Go to the Kootenai webpage at https://www.fs.usda.gov/kootenai for the latest on Closure Orders and Kootenai Forest fire map. Info on the Gibralter Ridge and Caribou can also be found at https://www.inciweb.gov.

(source: https://www.fs.usda.gov/detail/kootenai/alerts-notices/?cid=fseprd557677)

Kootenai National Forest Fire Update for September 3, 2017

Release Date: Sep 3, 2017

Contact(s): Willie Sykes

LIBBY, Mont. September 3, 2017 – This is the September 3 fire update of the fires that are burning on the Kootenai National Forest. The Gibralter, Caribou, West Fork, and Highway 200 Complex fires are detailed below. Personnel, equipment and other resources are on the scene at these fires and other resources are on order to respond to the fires.

Minimal fire growth has been reported on the Gibralter Ridge Fire and crews will continue to mop-up, patrol and monitor the west, south and east sides of the fire. Pre-evacuation warnings and closure orders are in place in the vicinity of the fire areas. Wam Lookout was wrapped for fire protection.

The Caribou Fire made significant runs yesterday doubling in size to 13,767 acres. The Lincoln County Sheriff's Office issued a full evacuation for the West Kootenai area. A new closure order encompassing a larger area is in place for the Caribou Fire. An unknown number of structures have been lost to the fire during the evening and last night. Firefighters worked late into the night to build fireline adjacent to structures in front of the fires. The Sheriff's Office will be assessing the West Kootenai area where structures burned and notifying property owners. Fire managers will continue coordinating with Canadian fire managers on fire suppression activities.

The West Fork Fire is located in the Quartz Creek and Bobtail Ridge area on the Libby Ranger District and is now estimated at 1,600 acres. The fire is experiencing spotting and active fire behavior and with the windy conditions expect to see smoke in the air. The Lincoln County Sheriff's Office is requesting the public to avoid the Kootenai River Road, Quartz Creek Road, Bobtail Road and Bobtail Cutoff areas to facilitate safe fire response and public safety.

A Type III team is in place to provide fire suppression and will collaborate with Lincoln County and the Lincoln County Sheriff's Office to provide a coordinated fire response.

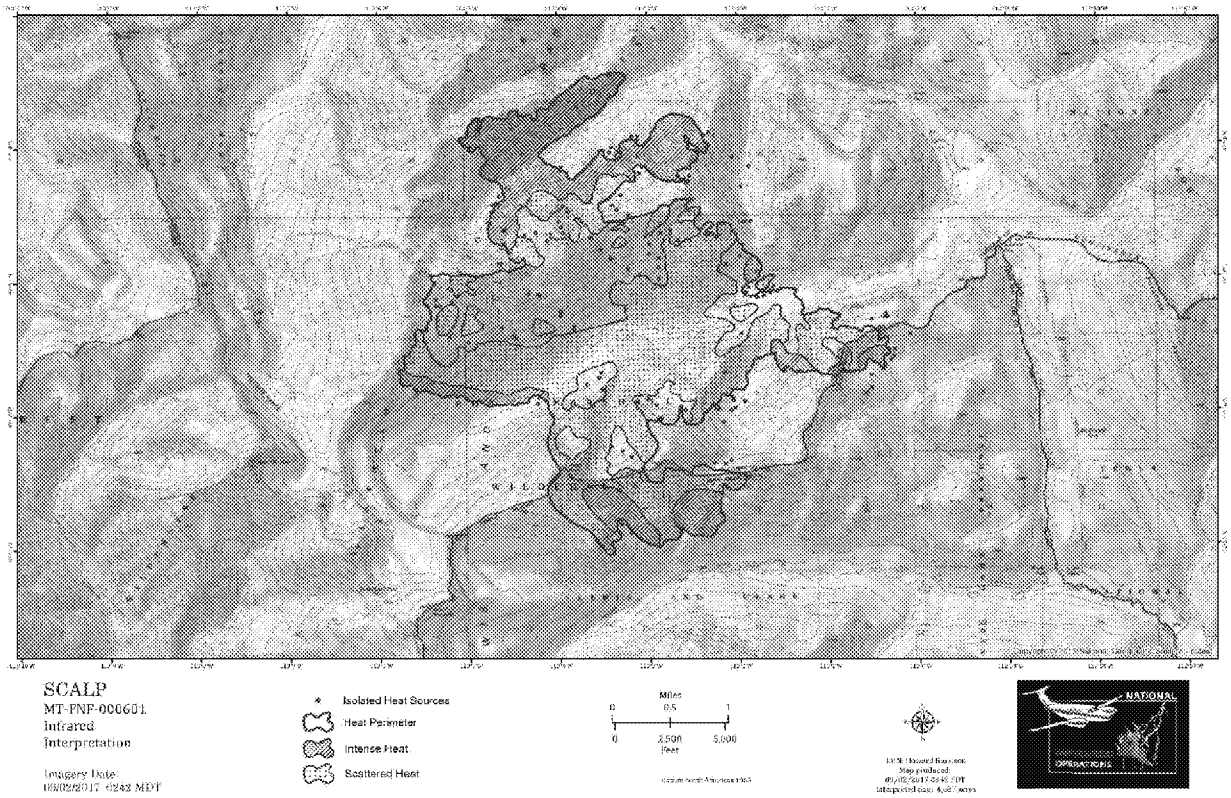
Pre-evacuation warnings have been issued for residents in the upper end of Bobtail Road north of Bobtail Cutoff, including Horton Drive Bobtail Cut-off, including Winter Road and Whitetail Road, Pipe Creek Road from Forest Way, including Lodge Pole Road, Blue Mountain Lookout Road and Doak Creek Road, and Creekside Road to 17 Mile Road. A public meeting on the West Fork Fire will be held today, September 3 at 4:00 p.m. at the Libby Middle/High School, 150 Education Way, Libby, MT.

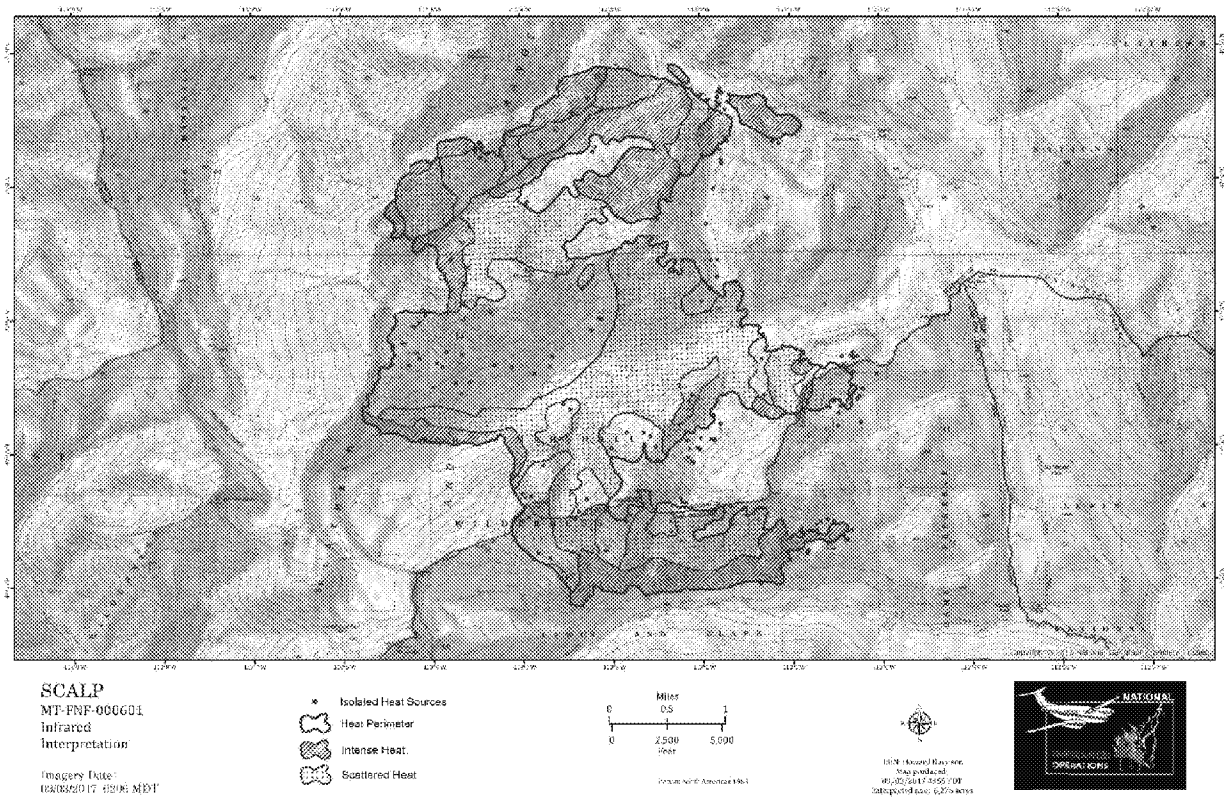
The Highway 200 Complex fires include the Readers Fires, Miller Fire, Moose Peak Fire and the Cub Fire on the Cabinet Ranger District and Deep Creek and Sheep Gap Fires on the Plains-Thompson Falls Ranger District on the Lolo National Forest. These fires are now estimated at 9,633 acres with zero percent containment. Area closures are currently in place around immediate fire areas and areas integral to safe fire operations. Pre-evacuations have been issued to residents near the Sheep Gap Fire. Mandatory evacuations have been issued to residents East of Plains near River Road West to Arnold Road.

A Red Flag warning is in place from 12:00-9:00 p.m. High temperatures and windy conditions will make fire behavior more intense and less predictable. Stage II Fire Restrictions are in effect for Lincoln County and Kootenai National Forest due to extreme fire danger.
Current fire conditions can be found at www.firerestrictions.us. Go to the Kootenai webpage at https://www.fs.usda.gov/kootenai for the latest on Closure Orders and Kootenai Forest fire

https://www.fs.usda.gov/detail/kootenai/alerts-notices/?cid=fseprd557687

Scalp (acres burned, 9/2)





Sprague (acres burned, 9/2)

Glacier National Park – Sprague Fire

PREPARATIONS ARE BEING MADE FOR WIND SWITCH

Saturday, September 2, 2017

Preparations are being made for the east winds forecast for Sunday night. Glacier National Park will be issuing an Evacuation *Warning* on Saturday, September 2, 2017, from the south end of Lake McDonald north to Logan Pass. This will include the North McDonald Road. This will ***not*** include the Apgar area at this time. An Evacuation *Warning* is triggered when current or projected threats from hazards associated with the Sprague Fire are severe enough to indicate a good probability of the need to evacuate.

The Going-to-the-Sun Road will remain open. The Sprague Creek and Avalanche Campgrounds will be open on Saturday night but will close by noon on Sunday. Glacier Park Boat Co. will remain open at Lake McDonald Lodge. Swan Mountain Outfitters at Lake McDonald will be open on Saturday and closed on Sunday. Effective Sunday morning, all trails accessed from the Going-to-the-Sun Road from the south end of Lake McDonald to Avalanche, including Trail of the Cedars, will be closed.

Structure protection work resuming in Lake McDonald area. The Fort Apache Hotshots will be working in the Lake McDonald area installing hose lays, sprinklers, and pumps as contingency measures given the predicted east winds.

The following trails are currently closed due to fire activity. The Avalanche Lake Trail including the Avalanche Lake area, Sprague, Snyder, and Lincoln Creek drainages and associated trails, from Lake McDonald Trailhead on the west and *Gunsight Lake* on the east, are also closed to all use. Visit http://go.nps.gov/glacconditions for trail, road, and campground information.

The Sprague Fire perimeter is now estimated at 5,116 acres. An infrared flight on Friday night reported a growth of 470 acres. Hot, dry weather dominates the forecast. The fire is burning actively in high elevation areas that normally would not carry fire.

Lake McDonald Lodge is closed for the season. Other concessions operations adjusted their services in the Lake McDonald Lodge area. The Swan Mountain Outfitters will continue to guide horseback rides out of their Lake McDonald corral on Saturday, and Glacier Park Boat Company will continue to offer boat tours on Lake McDonald, with some schedule changes to accommodate concerns about localized poor air quality during mornings and evenings.

Fire managers are working to protect values at risk and evaluating structure protection needs. The fire is now very close to the Mt. Brown Lookout which is a priority value at risk and is wrapped with protective material. Other threatened values include backcountry cabins and campgrounds, structures in the Lake McDonald area, and trail infrastructure such as footbridges.

Smoke will continue to settle into low-lying areas when air temperatures cool at night and in the early morning hours. If you encounter smoke while driving, slow down, turn on your headlights, and watch out for people and wildlife. Montana Wildfire Smoke Updates are available on http://svc.mt.gov/deq/todaysair/. If it's smoky in one area of the park, there are often other areas of the park with better visibility. Smoke conditions vary in intensity, location and duration with fire activity. You can monitor current conditions on the Park's webcams at http://go.nps.gov/glacwebcams.

Fire Information Line: 406-888-7077
Inciweb: https://inciweb.nwcg.gov/incident/5510/ (fire updates, maps and photos, air quality info, and park webcams)
Facebook: https://facebook.com/GlacierNPS
Twitter: https://twitter.com/GlacierNPS

Evacuation Order implementation was implemented successfully

Incident: Sprague Fire Wildfire

Released: 9/3/2017

The evacuation ORDER was implemented in a successful manner. Glacier National Park contacted landowners within the Park and visitors starting at 10:00 am on Sunday September 3, 2017. Visitors were informed about the closure as they entered the Park and at checkpoints within the closure area by 6:00 p.m. The closure is from the south end of Lake McDonald north to Logan Pass. This includes the North McDonald Road. This does *not* include the Apgar area at this time. Logan Pass is still accessible from the east side of the Park. The duration of the evacuation is unknown at this time.

The National Weather Service has issued a Red Flag Warning effective through 9 pm Monday. The approaching cold front is a marker of extreme fire behavior. The predicted high winds from the east this evening could increase activity on the west side of the Sprague Fire. Warm and dry conditions allowed the Sprague Fire to spread into the Lincoln Creek drainage last night. The fire size is now estimated to be 6,833 acres. Fire behavior was modest throughout the day.There was no bucket work on the fire today due to the smoky conditions. Reconnaissance flights were conducted and personnel at the Sperry Chalet were resupplied.

Structure protection work was completed in the Lake McDonald Lodge area. The Fort Apache Hotshots along with structure protection engines will be staged overnight in the Lake McDonald Lodge area. There will be a night shift observing the fire and assisting with fire behavior monitoring and operation strategies. Resources remain scarce across the Nation.

Drones. This is a reminder that if a drone is detected in the flight area of Fire Aviation we need to ground the aircraft until the drone is removed from the area. If aircraft are diverted with a full load the load must be jettisoned prior to landing. In short, IF YOU FLY WE CANNOT.

Smoke. With the change in wind direction, dense smoke is predicted to impact the Lake McDonald corridor. You can monitor current conditions on the Park's webcams athttp://go.nps.gov/glacwebcams.

Red Cross Shelter. The American Red Cross is offering shelter for those impacted by the evacuation at the Canyon Elementary School, 200 North Street, Hungry Horse, MT, 59919. The shelter will open at 5:00 pm on Sunday. Please call 1-800-272-6668 for information about shelter services.

Most areas of the Park remain OPEN. All areas of the North Fork, Apgar Village, the Going-to-the-Sun Road between St. Mary and Logan Pass, Granite Park Chalet, Two Medicine, St. Mary,

Many Glacier, and Goat Haunt. Please check the Park website for current conditions athttps://nps.gov/glac.

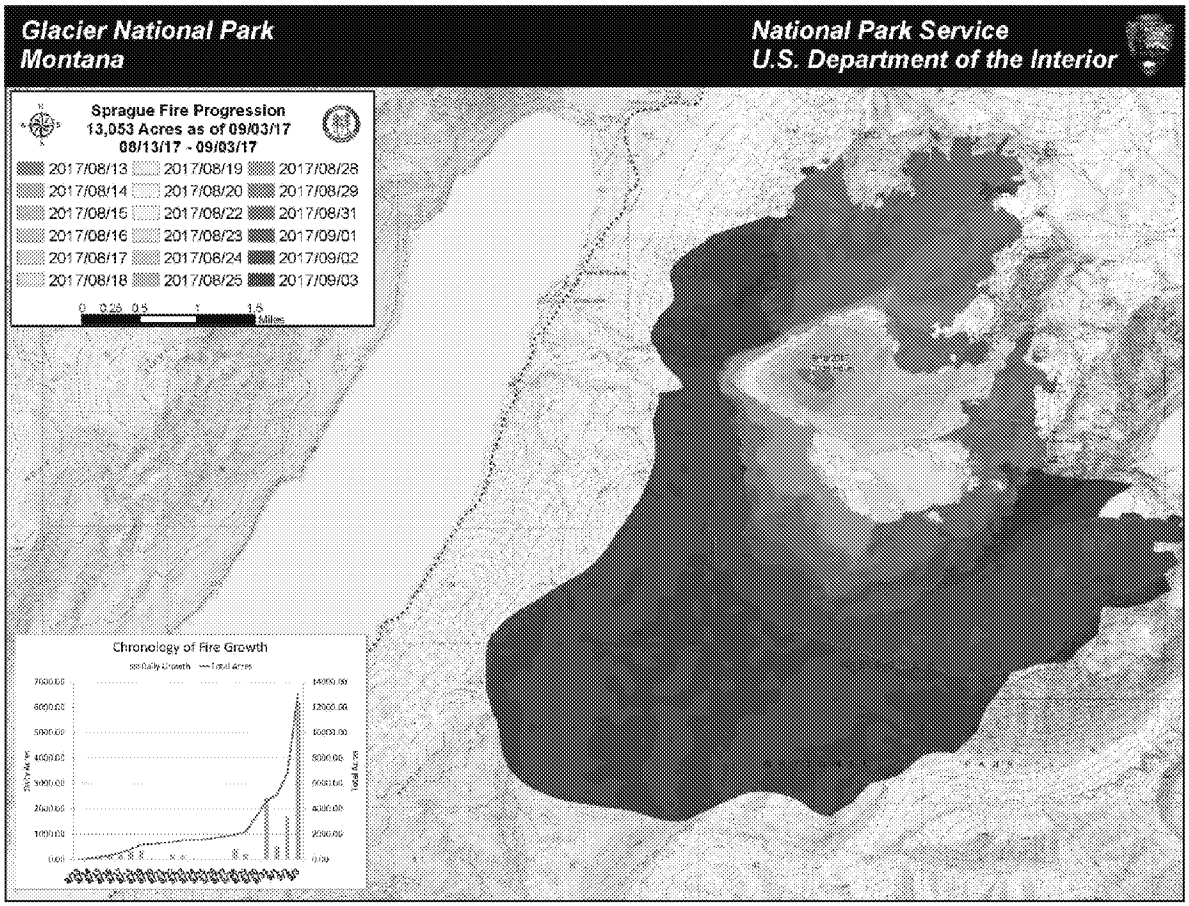
Fire Information Line: 406-888-7077

Inciweb: https://inciweb.nwcg.gov/incident/5510/ (fire updates, maps and photos, air quality info, and park webcams)

Facebook: https://facebook.com/GlacierNPS

Twitter: https://twitter.com/GlacierNPS

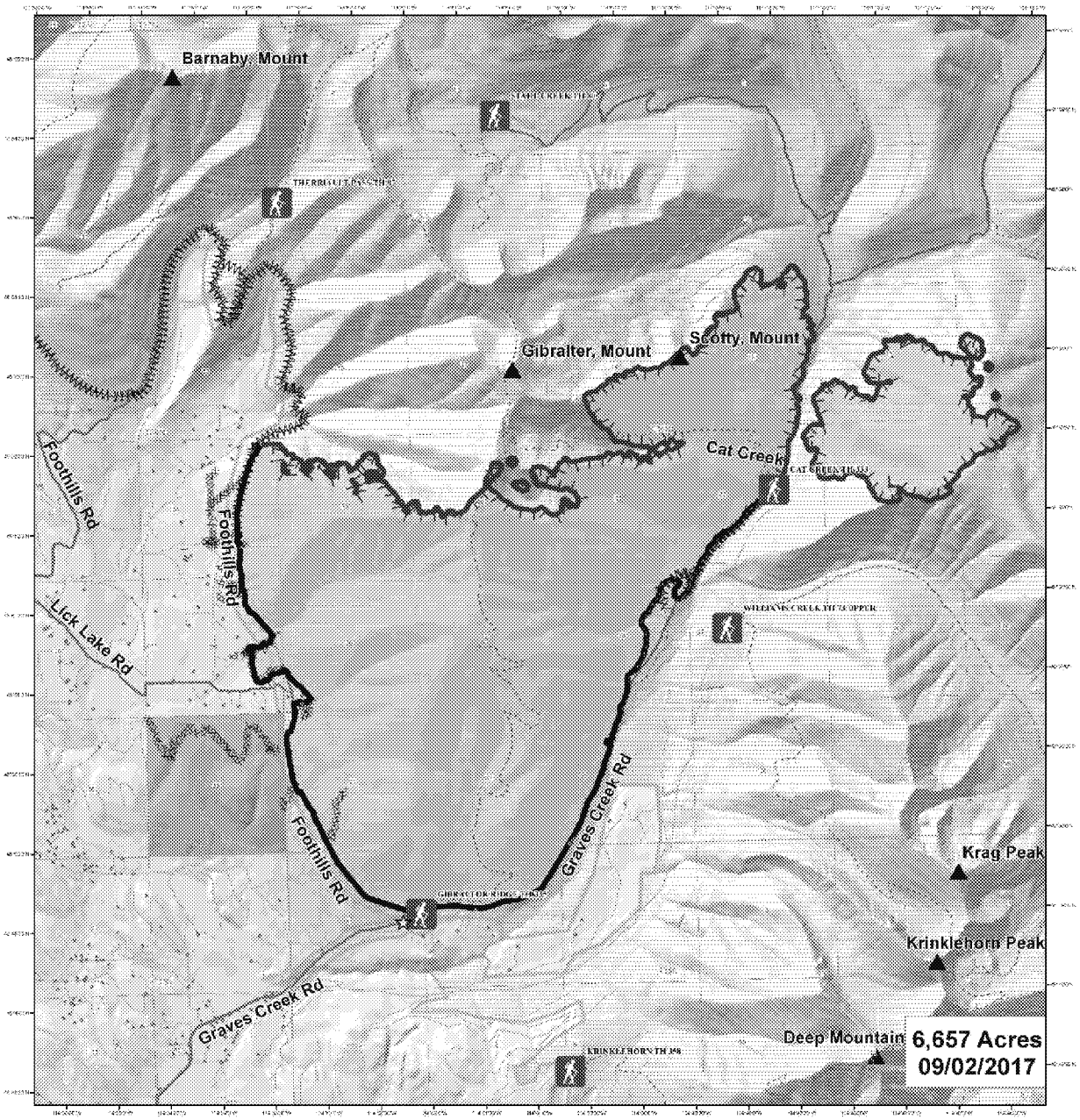
Montana Wildlife Smoke Updates: http://svc.mt.gov/deq/todaysair



Gibralter Ridge (acres burned, 9/2)

Information

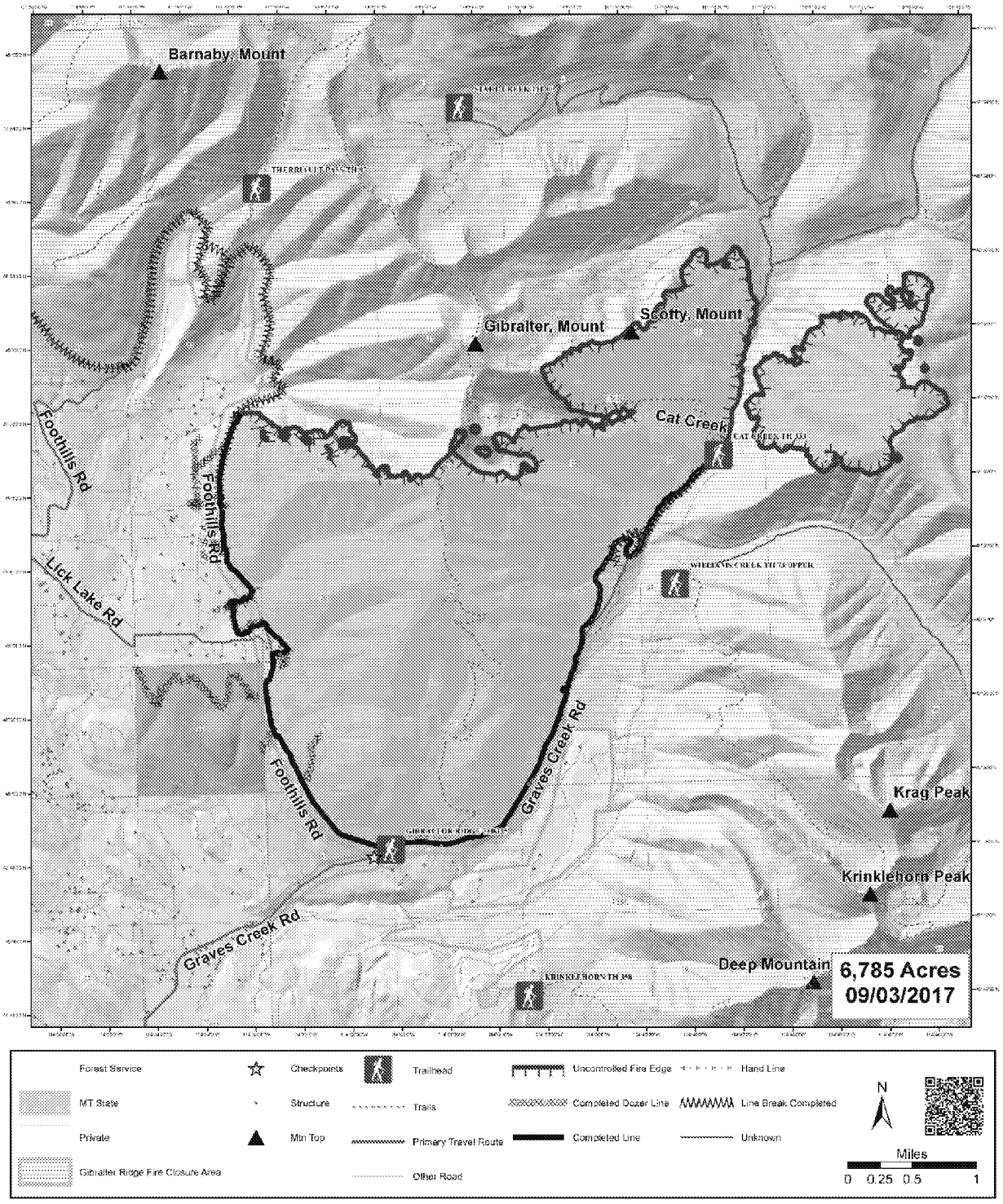
Gibralter Ridge Fire
MT-KNF-000161



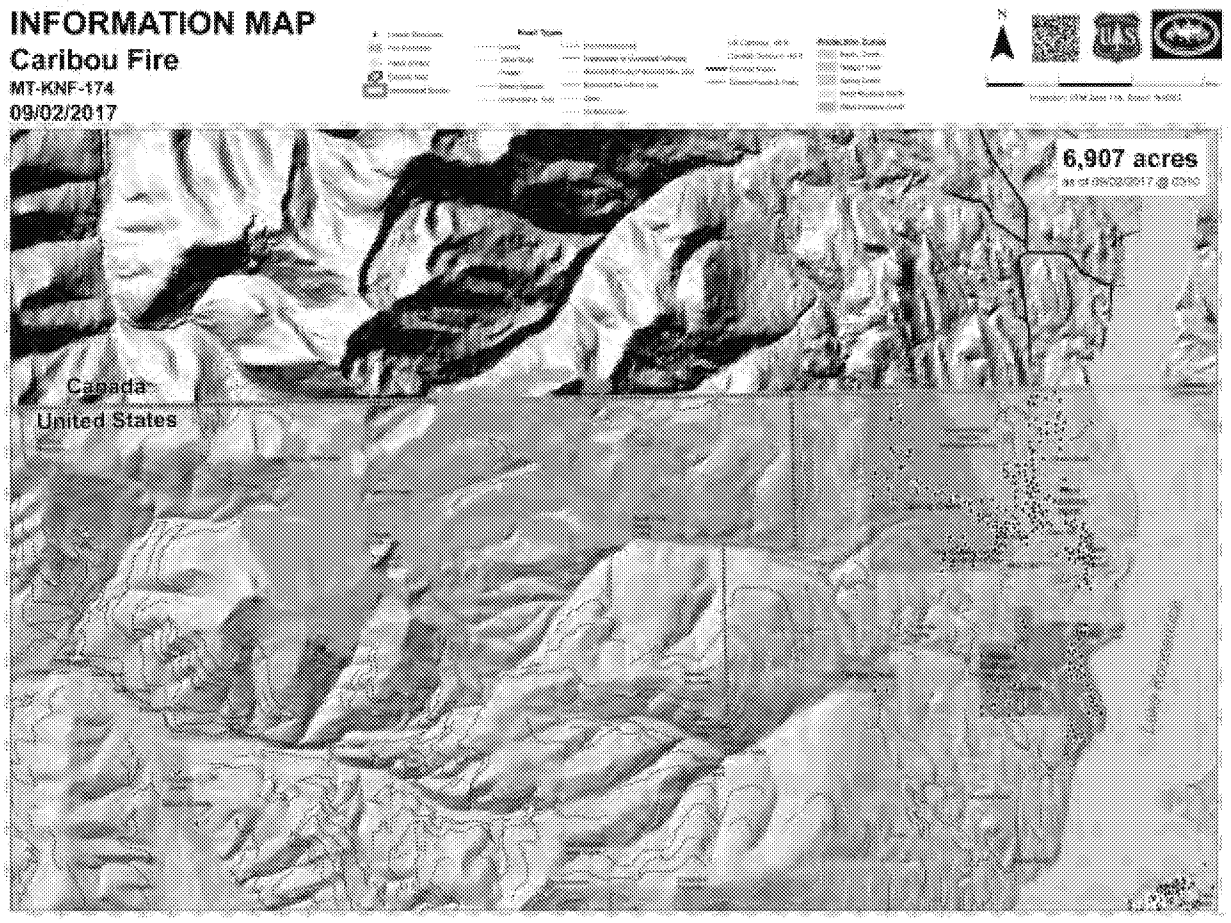
Forest Service
MT State
Private
Gibralter Ridge Fire Closure Area
Checkpoints
Structure
Mtn Top
Trailhead
Trails
Primary Travel Route
Other Road
Uncontrolled Fire Edge
Completed Dozer Line
Completed Line
Hand Line
Line Break Completed
N
Miles
0 0.25 0.5 1

Information

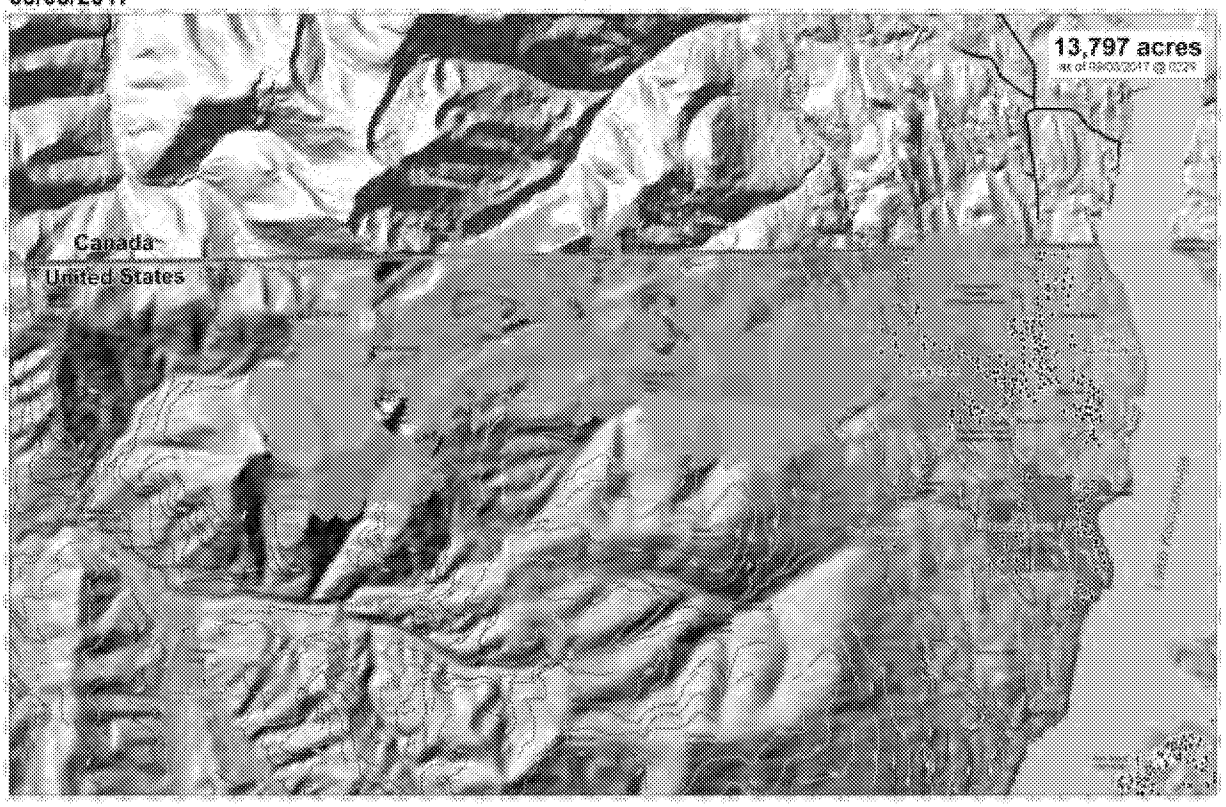
Gibralter Ridge Fire
MT-KNF-000161



Caribou (acres burned, 9/2)



INFORMATION MAP
Caribou Fire
MT-KNF-174
09/03/2017



Uno Peak (acres burned, 9/2)

InciWeb - Incident Information System

Uno Peak Fire News Release

Uno Peak Fire September 2, 2017

Incident: Uno Peak Fire Wildfire
Released: 9/2/2017

Crews work to halt southern fire spread; dry weather continues

Completion: 0%
Acres: 900
Start Date: August 30, 2017
Cause: Unknown
Location: 15 miles NW of Manson, WA
Total Personnel: 100
Fuels/Topography: Timber, grass, rugged terrain

Yesterday: The fire actively grew in the Safety Harbor drainage due to critical fire weather. Firefighters continued to strengthen fire control lines in the Coyote Ridge area ahead of potential fire spread to the southeast. Additionally a second fire, the Ferry Peak Fire, was reported approximately two miles to the northwest of the Uno Peak Fire and was estimated to be 75 acres in size.

"Our number one priority is firefighter and public safety," said Al Lawson, Incident Commander. "We will continue to actively engage these fires where it is safe to do so as we work to halt spread toward communities."

Today: Fire managers are planning to hold the fire west of Coyote Ridge utilizing and improving existing firebreaks and dozer lines in the area. Continued hot, dry weather and extremely rugged terrain will drive active fire behavior in areas of heavy dead and down timber. Ground and aerial resources will be used for a third consecutive day to halt fire spread to the southeast.

Smoke: Smoke is anticipated to drift down Lake Chelan and over the Waterville Plateau and will be highly visible from the communities of Manson and Chelan. However, all businesses in the Chelan area remain open and ready for business. More information about smoke and your health is available at wasmoke.blogspot.com/

Closures: An area closure is now in place for the vicinity of the fires. Specifically, Grade Creek Road (From the intersection with FS 8280-117 (Oss Peak Road) to the intersection with FS 4330-600 (South Fork Gold Creek Road)/FS 8020 (Cooper Ridge Road) is now closed. Trail closures include the Uno Peak Trail, Safety Harbor Trail, Summit Trail (From South Navarre Campground to junction with FS Trail 1258) and Summer Blossom.

Fire Information:
Inciweb: inciweb.nwcg.gov/incident/5572/
Text Message: text "follow UnoPeakFire" to 40404
Facebook: facebook.com/UnoPeakFire
Twitter: twitter.com/UnoPeakFire
#UnoPeakFire

Content posted to this website is for information purposes only.

NORTHWEST INCIDENT MANAGEMENT TEAM #10

Al Lawson-Incident Commander

Fires grow to 2,200 acres under critical fire weather

Sunday September 3, 2017

Fire: Uno Peak
Acres: 2,200
Cause: Unknown
Total Personnel: 120

Completion: 0%
Start Date: August 30, 2017
Location: 15 miles NW of Manson, WA
Fuels/Topography: Timber, grass, rugged terrain

Yesterday: Due to critical fire weather yesterday the fires actively spread to the bottom of the Safety Harbor drainage but did not cross to the southern side of the canyon. Fire managers continued to utilize water drops throughout the day to slow fire growth while hotshots and other ground resources improved control lines to the southeast.

"This weather and terrain is extremely hazardous to our firefighters," said Kari Grover-Wier, Chelan District Ranger. "With limited options for safe direct attack, we are working hard to improve lines that will hold the fire at Coyote Ridge."

Today: Potentially record high temperatures and low humidity could continue to drive active fire growth in the Safety Harbor Creek area. Crews and helicopters will continue to limit new growth to the southeast. The fire remains 15 air miles from the community of Manson, WA.

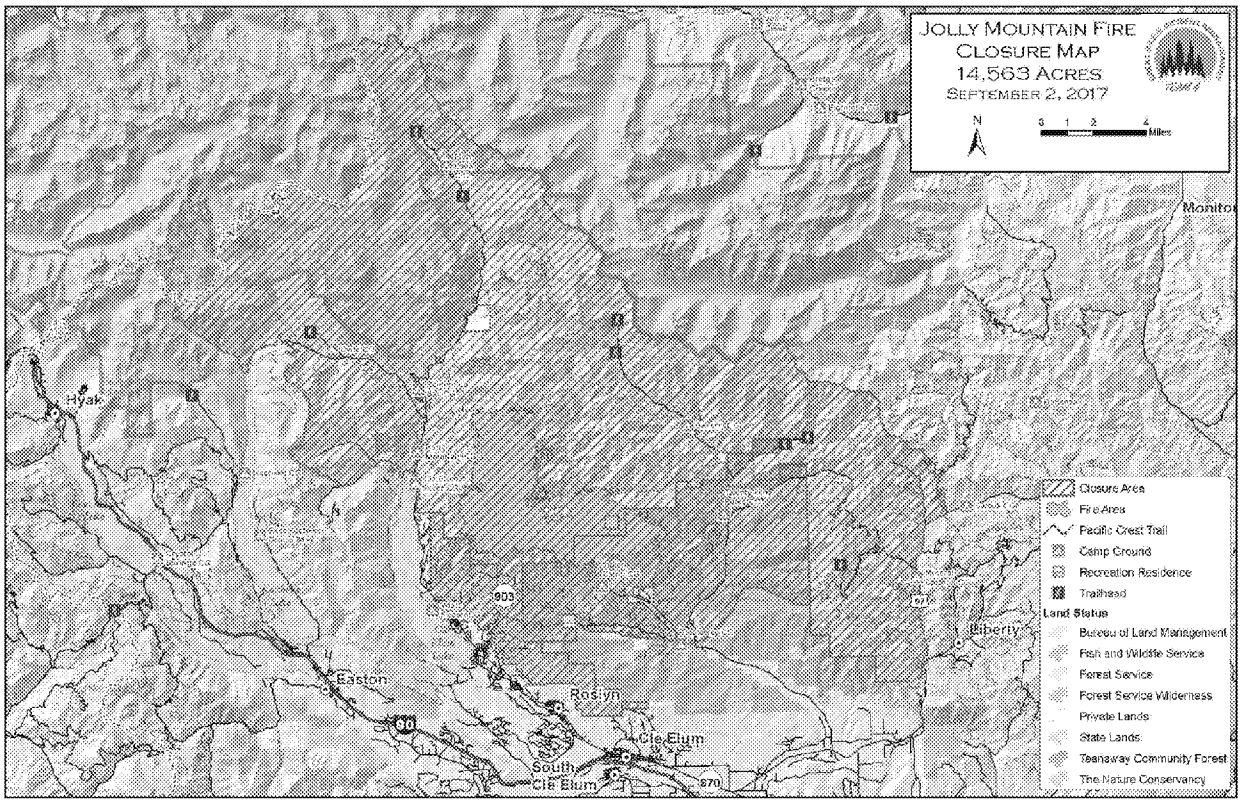
Smoke: Smoke is anticipated to drift down Lake Chelan and over the Waterville Plateau and will be highly visible from the communities of Manson, Chelan, Pateros, and Twisp. However, all businesses in the Chelan area remain open and ready for business. More information about smoke and your health is available at wasmoke.blogspot.com/

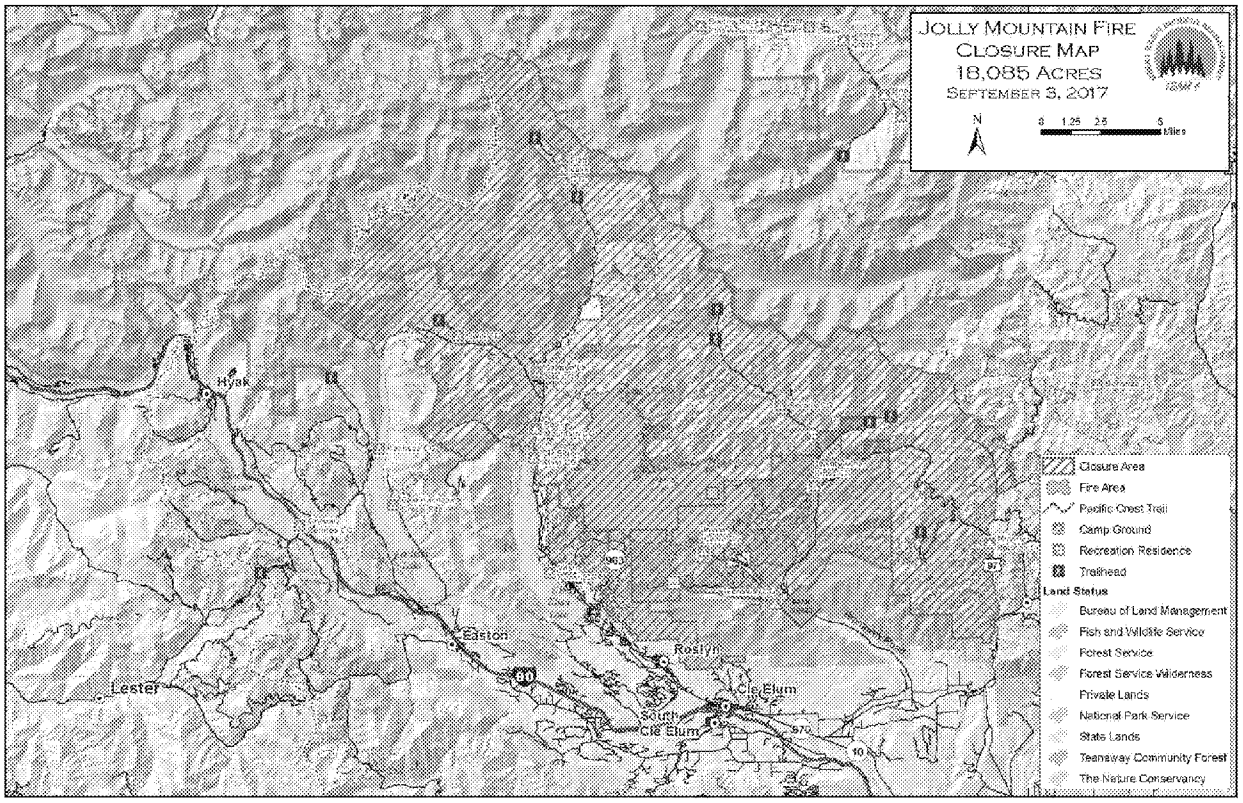
Closures: An area closure remains in place for the vicinity of the fires. Specifically, Grade Creek Road (From the intersection with FS 8200-117 (Oss Peak Road) to the intersection with FS 4330-600 (South Fork Gold Creek Road)/FS 8020 (Cooper Ridge Road) is now closed. Trail closures include the Uno Peak Trail, Safety Harbor Trail, Summit Trail (From South Navarre Campground to junction with FS Trail 1258) and Summer Blossom. The Deer Point and Safety Harbor Campgrounds are also closed.

Fire Information:
Inciweb: inciweb.nwcg.gov/incident/5572/
Text Message: text "follow UnoPeakFire" to 40404
Facebook: facebook.com/UnoPeakFire
Twitter: twitter.com/UnoPeakFire
Phone: 541-612-0642
#UnoPeakFire

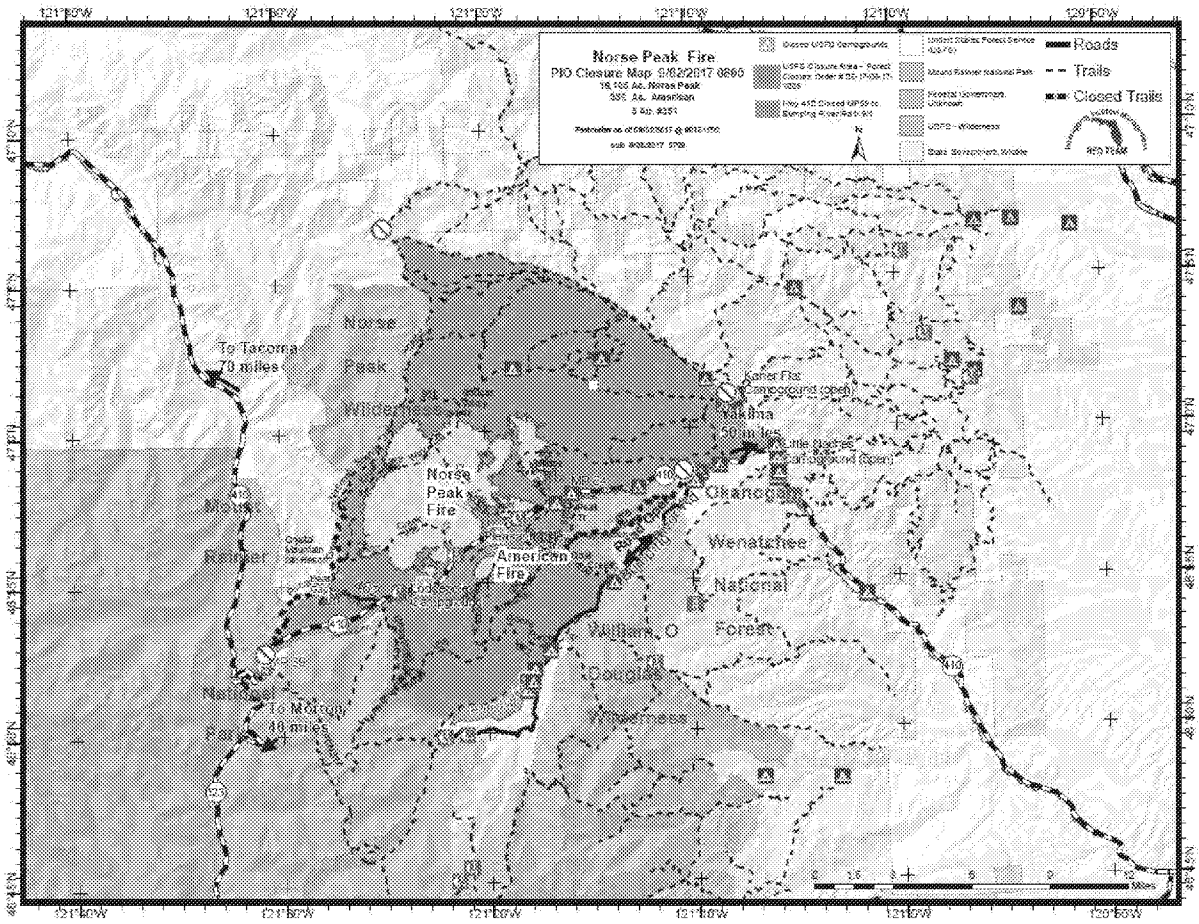
-End-

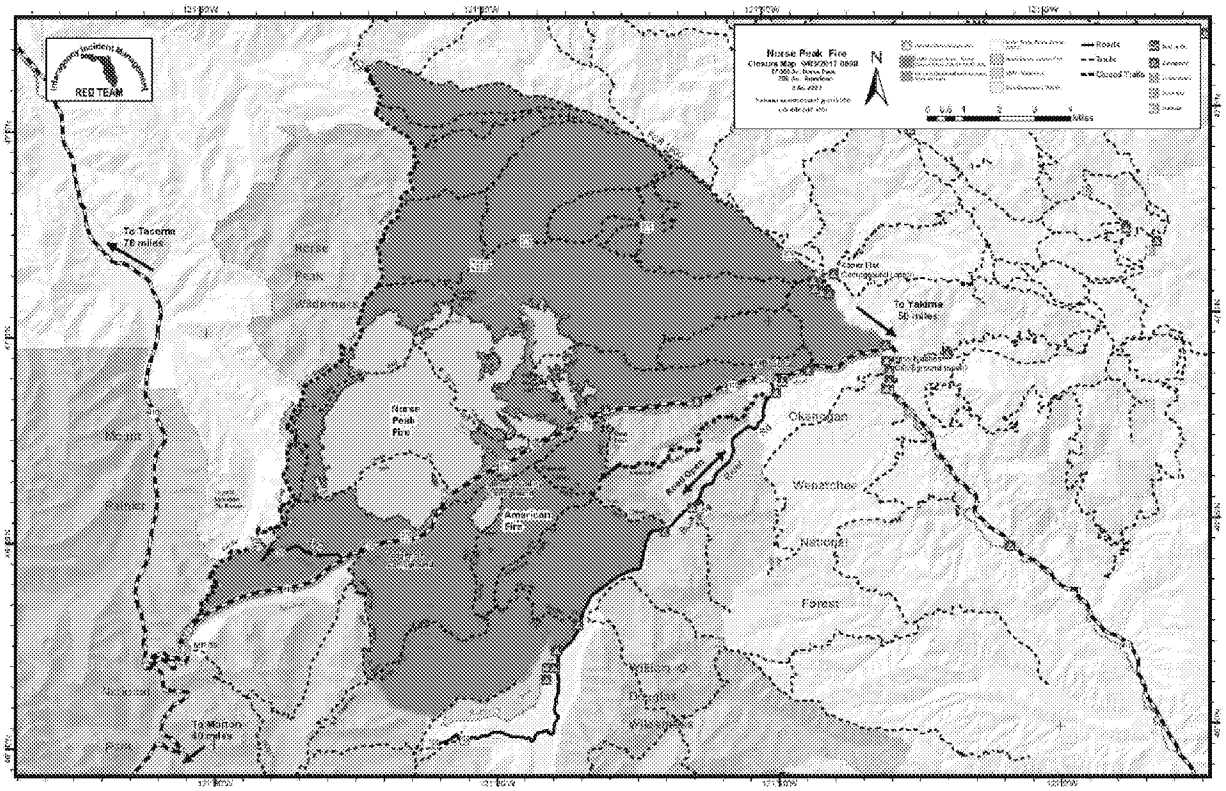
Jolly Mountain (acres burned, 9/2)





Norse Peak and American (acres burned, 9/2)




Norse Peak Fire
Closure Map
Roads
Trails
Closed Trails
Miles
RED TEAM
To Tacoma
70 miles
Norse
Peak
Wilderness
Norse
Peak
Fire
Mount
Rainier
American
Fire
To Yakima
50 miles
Okanogan
Wenatchee
National
Forest
Road Open
To Morton
40 miles

Jack Creek (acres burned, 9/2)

FIRE News Release
Wenatchee River Ranger District

600 Sherbourne St • Leavenworth, WA 98826 • 509-548-2550 • fs.usda.gov/okawen
CONTACT: Fire Information Officer: Carly Reed 509-548-2572
September 2, 2017

Jack Creek Fire burns into receptive fuels and puts up smoke column

Containment: 0%
Acres: 46
Start Date: August 11, 2017
Cause: Lightning
Location: 15 miles WSW of Leavenworth, WA
Fuels/Topography: Timber, grass, rugged terrain

The Jack Creek Fire located entirely within the Alpine Lakes Wilderness put up a visible smoke column yesterday afternoon. Fire activity was minimal for three weeks as it sat dormant before burning into receptive fuels. Continued low humidity levels and high temperatures also contributed to increased fire activity, causing it to grow to 46 acres and spot across Jack Creek.

Fire managers on the Okanogan-Wenatchee National Forest have chosen a "monitor" management strategy to maintain wilderness values. The Jack Creek fire started naturally by lightning and is playing its important role in achieving ecological benefits. Areas surrounding the fire perimeter have previously burned, including a fire footprint from 2008 directly to the east. A natural mosaic burn pattern helps prevent large catastrophic wildfires and keeps forest ecosystems healthy. Other priorities include firefighter and public safety and protecting values at risk.

Management Action Points have been set for additional closures, point protection and suppression activities. Actions will be taken where there is a high probability for success, if the fire poses threats to life or property. Fire managers will monitor the fire from the air utilizing air craft supporting other higher priority fires in the area.

Smoke may settle in the mornings, however, Leavenworth and Lake Wenatchee businesses are fully open and operational. There are many opportunities to recreate in and around our beautiful community.

Trail closures are in effect in the Jack Creek area for public and firefighter safety concerns. The Jolly Mountain Fire on the Cle Elum Ranger District has also closed a significant portion of the Alpine Lakes Wilderness. Click here to view Okanogan-Wenatchee National Forests interactive fire closure map.

###

FIRE News Release
Wenatchee River Ranger District

600 Sherbourne St • Leavenworth, WA 98826 • 509-548-2550 • fs.usda.gov/okawen
CONTACT: Fire Information Officer: Carly Reed 509-548-2572 • http://tinyurl.com/JackCreekIncIweb
September 3, 2017

Jack Creek Fire growth prompts new trail closures

Acres: 692
Containment: 0%
Start Date: August 11, 2017
Cause: Lightning
Location: 15 miles WSW of Leavenworth, WA

An infrared flight last night revealed the Jack Creek Fire grew to the south in the Van Epps Drainage and grew significantly east through the 2008 Jack Creek footprint. The fire spotted over Jack Ridge and is established in the Eightmile drainage, prompting immediate evacuations of campers and day hikers in the area. Expanded fire closures are being evaluated for public and firefighter safety concerns. Wilderness Rangers are currently closing and sweeping the trails in the Eightmile Lake, Caroline Lakes and Jack Creek area.

Firefighters are hiking into Eightmile Lake to assess fire activity, point protection strategies and additional resource needs.

Fire activity is expected to increase through the weekend due to unstable air mixed with hot and dry conditions. A Red Flag warning is in effect for high Haines indices between 5 and 6, through Sunday at 8:00 p.m.

Trail Closures: Eightmile Lake no. 1552, Eightmile-Trout Lake Trail no. 1554, Trout Creek Trail no. 1555, Jack Ridge Trail no. 1557, Jack Creek Trail no.1558, Meadow Creek Trail no. 1559, Solomom Creek Trail no. 1593, and Van Epps Trail no. 1594.

Air Quality: Smoke from Jack Creek combined with other area fires will decrease visibility in the upper Wenatchee Valley. Visit http://tinyurl.com/WaAirQual for air quality information. Leavenworth and Lake Wenatchee businesses are fully open and operational. There are many opportunities to recreate in and around our beautiful community.

On Saturday September 2, 2017 Gov. Inslee declared a statewide state of emergency for Washington due to wildfires throughout the state. This activates the National Guard and State EOC.

###

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Diamond Creek (acres burned, 9/2)

Note: detailed information on the Diamond Creek Fire was only available at sporadic times during the episode in question. In order to estimate the number of acres burned on 9/2, the total acres burned from 9/2-9/5 was distributed evenly per day. It should be noted that the 9/2 acreage was taken from a morning report, while the 9/5 acreage was taken from infrared detection during an evening flight. With 36,169 acres burned during that 4-day period, the estimated area burned on 9/2 was 9042 acres. Active fire conditions on 9/2 can also be confirmed from the Diamond Creek Fire News Release of 9/3. The cause of this wildfire was initially listed as human but has been updated to unknown (see below).

InciWeb - Incident Information System

Diamond Creek Fire News Release

Diamond Creek Fire September 2

Incident: Diamond Creek Fire Wildfire
Released: 9/2/2017

Diamond Creek Fire Update
Saturday, September 2

Information: (509)785-5724 - 8 am – 6 pm
Email: diamondcreekfire@gmail.com
Websites: https://inciweb.nwcg.gov/incident/5409/
Facebook: https://www.facebook.com/diamondcreekfire2017
Smoke Conditions: http://wasmoke.blogspot.com
Location: Methow Valley Ranger District on the Okanogan-Wenatchee National Forest; 12 miles north of Mazama, WA
Summary: Fire growth was limited on Friday. It continued moving southeast into the Ashnola drainage, as well as moving farther north and east into British Columbia. The fire also became active on the west side in Ptarmigan Creek, where helicopter water drops were used to cool the fire and prevent it from moving farther up the drainage. Helicopters will work this area again today.Persistent heat on the ridge above Pat Creek cooled noticeably on Friday. Helicopter water drops will be used again today to hold the fire in Drake Creek and keep it from moving into Pat Creek. Application of fire wrap to the historic cabin at Pasayten Airstrip was completed on Friday, and the crew hiked out. Today chippers will continue to treat slash created as part of the preparation work on the indirect fire line. Chippers will still be working on Blackpine Basin Road 5225 beyond the Goat Peak Lookout 5225-200 road junction.
Fire behavior on Saturday will remain active, continuing to burn interior islands and moving into the Ashnola River drainage to the southeast toward the Spanish Camp and Remmel Lake areas. Smoke will continue to affect air quality in the upper Methow Valley.
Closures: TRAIL AND AREA CLOSURES FOR PUBLIC SAFETY ARE IN EFFECT. The following trails are closed: Monument Trail #484, Tatoosh Buttes Trail #485, Eureka Creek Trail #474, Andrews Creek #504, Chewuch River #510 beyond the junction with Fire Creek #361, Topaz Mountain #360, Boundary Trail #533 between Teapot Dome and the junction with Middle Fork Pasayten Trail #476. Road & trail closures are posted on Inciweb:
https://inciweb.nwcg.gov/incident/closures/5409
Eightmile Road #5130 is now open as far as Honeymoon Campground.

Weather: Saturday expect very dry humidity and above normal temperatures along with poor overnight humidity recovery. There will be widespread haze and patchy smoke; sunny, with a high of 91 in the valley, 79 at 6,000 feet. Winds will be upslope/up valley 3 to 6 mph. Ridgetops will have southwest winds 6 to 18 mph, with gusts to 16 mph.
A fire weather watch is in effect from Sunday afternoon through Sunday evening for hot and unstable conditions. There is no precipitation expected through the middle of next week.
Fire Restrictions: Fire restrictions remain in place. Maintaining, attending, or using a fire or campfire, and use of charcoal briquette barbecues, or other devices that use solid fuel is prohibited across most of the Okanogan-Wenatchee National Forest. An Industrial Fire Precaution Level III is in effect which does not allow any firewood cutting with a power saw for commercial or personal use.
Estimated size (US): 56,794 ac.
Estimated size (Canada): 10,000 ac.
Objectives completed: 65%
Structures damaged: 1
Structures destroyed: 2
Injuries: 1
Date detected: July 23
Cause: Human
Estimated cost: $8 million
Resources: 1 handcrew, 1 engine, 3 helicopters, 2 chippers, 1 water tender. Total personnel: 89.

Content posted to this website is for information purposes only.

InciWeb - Incident Information System

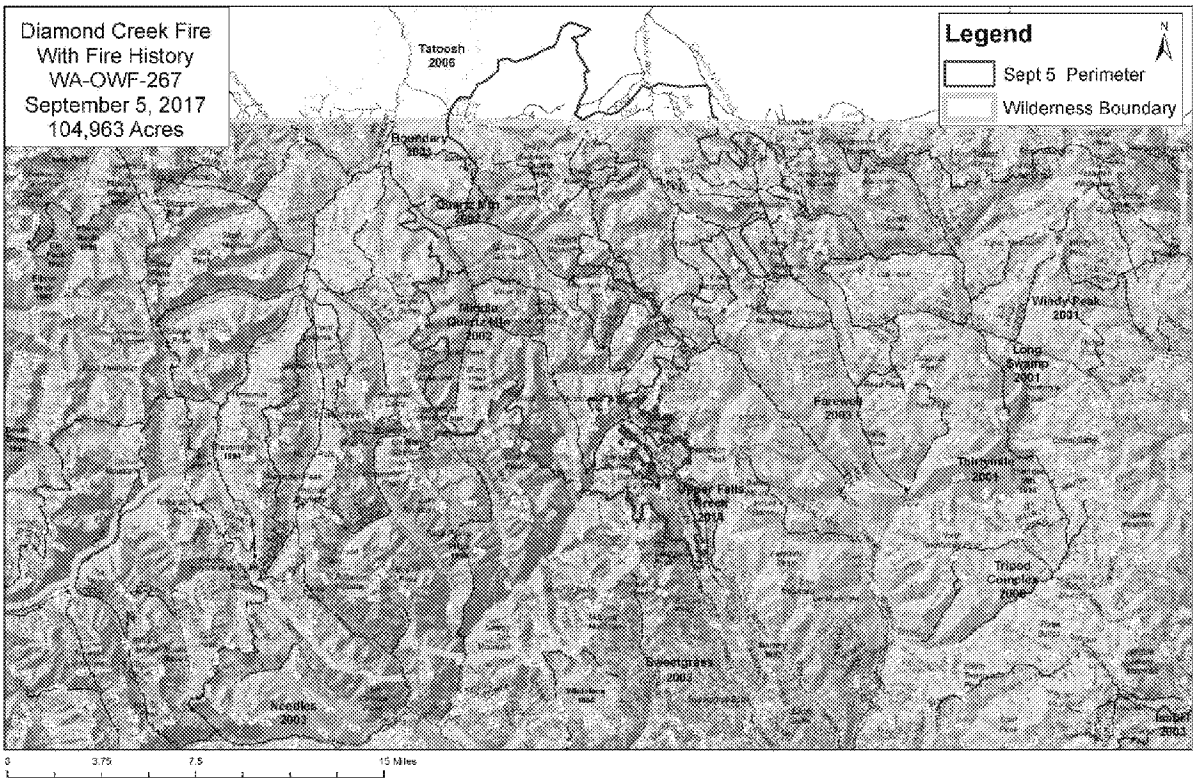
Diamond Creek Fire News Release

Diamond Creek Fire September 3

Incident: Diamond Creek Fire Wildfire
Released: 9/3/2017

Summary: The fire continued moving southeast into the Ashnola drainage as well as moving farther north and east into British Columbia. The fire continued to actively burn on the west side in Ptarmigan Creek. Helicopter water drops continued in the Ptarmigan Creek area to cool the fire and prevent it from moving farther up the drainage. Helicopter water drops also continued to hold the fire in Drake Creek and Pat Creek. A heavy helicopter was available, as well as 2 medium helicopters and a light helicopter for the drops. Wilderness Rangers used pack animals to transport supplies to wrap the historic cabins at Pasayten Airstrip and Spanish Camp. This work was completed on Friday. Today chippers will continue to treat slash created as part of the preparation work on the indirect fire line. Chippers will still be working on Goat Creek Road 5225 past the 200 road junction.
Fire behavior on Sunday will remain active, continuing to burn interior islands and moving into the Ashnola River drainage to the southeast toward the Spanish Camp and Remmel Lake areas. Smoke will continue to affect air quality in the upper Methow Valley. In the Methow Valley for the Labor Day weekend the air is expected to be smoky in the morning, with clearing in the afternoon.
Closures: TRAIL AND AREA CLOSURES FOR PUBLIC SAFETY ARE IN EFFECT. The following trails are closed: Monument Trail #484, Tatoosh Buttes Trail #485, Eureka Creek Trail #474, Andrews Creek #504, Chewuch River #510 beyond the junction with Fire Creek #561, Topaz Mountain #360, Boundary Trail #533 between Teapot Dome and the junction with Middle Fork Pasayten Trail #476. Road & trail closures are posted on inciweb: https://inciweb.nwcg.gov/incident/closures/5409/.
Weather: Expect very dry humidity and above normal temperatures on Sunday along with poor overnight humidity recovery. There will be widespread haze and patchy smoke. It will be sunny with a high of 91° in the valley and 79° at 6,000 feet. Winds will be upslope/upvalley 3 to 6 mph. Ridgetops will have southwest winds 6 to 10 mph, with gusts to 15 mph. A fire weather watch is in effect from Sunday afternoon through Sunday evening for hot and unstable conditions. There is no precipitation expected through the middle of next week. With the dry and unstable weather conditions an increase in fire activity may result in additional road and trail closures, so keep informed on conditions.
Fire Restrictions: Fire restrictions remain in place. Maintaining, attending, or using a fire or campfire, and use of charcoal briquette barbecues, or other devices that use solid fuel is prohibited across most of the Okanogan-Wenatchee National Forest. An Industrial Fire Precaution Level III is in effect which does not allow any firewood cutting with a power saw for commercial or personal use.

Content posted to this website is for information purposes only.


Diamond Creek Fire
With Fire History
WA-OWF-267
September 5, 2017
104,963 Acres
Legend
Sept 5 Perimeter
Wilderness Boundary
N
Tatoosh
2006
Boundary
2001
Quartz Mtn
2002
Middle
Quartz Mtn
2002
Windy Peak
2001
Long
Swamp
2001
Farewell
2003
Thirteenth
2001
Upper Falls
Creek
2018
Tripod
Complex
2006
Sweetgrass
2003
Needles
2003
Imbrit
2003
0
3.75
7.5
15 Miles

Diamond Creek Fire

- Incident Information

This incident is no longer being updated.

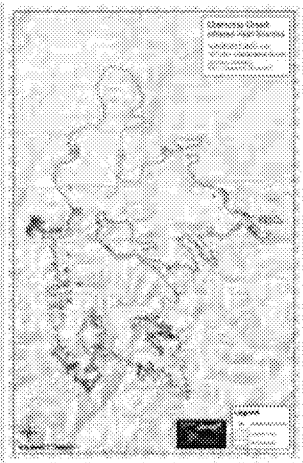
INCIDENT UPDATED 12/4/2017

Approximate Location

48.855 latitude, -120.414 longitude

Province of British Columbia, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

Incident Overview



Diamond Creek Fire is declared controlled today, October 23, 2017. The Snotel weather stations at Harts Pass and Washington Pass are showing about 22-25 inches of snow with high moisture content. There may be minimal suppression repair work left to do next spring.

All area and trail closures for the Diamond Creek Fire were lifted on October 20. Forest visitors are cautioned that hazards still exist in burned areas such as falling snags/dead trees which might injure people or block roads or trails, stump holes and root channels that may be burning and are hidden from sight until stepped upon, and rolling rocks and mudslides or debris flows off hillsides can occur any time but especially after rain and freeze-thaw events. Please stay current on weather forecasts, carry a saw or axe in case a tree falls across a rod or trail, and always let someone know where you are going and when you plan to return home.

For information about Burned Area Emergency Response work occurring in the national forest, go to http://centralwashingtonfirerecovery.info/ .

For public safety, road closures at Yellowjacket Sno-Park and upper Eightmile Road above Copper
Glance Trailhead will remain in place until the end of November. There will be large construction equipment working in the roadway, crews falling hazardous trees, and logging truck traffic will occur on these steep and narrow roads associated with timber salvage and Burned Area Emergency Response work. For information about these temporary road closures please contact the Methow Valley Ranger District office at 509-996-4003.

Basic Information

Current as of	1/24/2018, 11:37:55 AM
Incident Type	Wildfire
Cause	Unknown
Date of Origin	Sunday July 23rd, 2017 approx. 09:45 AM
Location	11 miles NNW of Mazama, WA.

Current Situation

Size	128,272 Acres
Percent of Perimeter Contained	90%
Fuels Involved	Timber (Litter and Understory). Heavy fuel loading in the Monument and Pat Creek drainages.

Outlook

Planned Actions	
Remarks	US acres are 97,140 acres. Canadian acres are 31,132.

(source: https://inciweb.nwcg.gov/incident/5409/)

Appendix D: APCD Air Quality Advisories September 1-4, 2017

September 1, 2017

COLORADO SMOKE OUTLOOK:

Friday, September 1, 2017, 2:30 PM MDT

Areas of haze are likely on Friday and Saturday across Colorado due to smoke being transported from wildfires in the northwestern United States. No major health impacts are anticipated, however **unusually sensitive people** should consider reducing prolonged or heavy exertion on Friday and Saturday.

Front Range

Action Day for Ozone

The Colorado Department of Public Health and Environment has issued an **ACTION DAY ALERT** at 4PM on Friday, September 1, 2017 for the Front Range Urban Corridor from El Paso County north to Larimer and Weld counties, including the Denver-Boulder area, Colorado Springs, Fort Collins and Greeley.

Light winds, ample sunshine, and warm temperatures will promote ground-level ozone formation and Unhealthy for Sensitive Groups conditions are expected for the southern and western suburbs of the Denver Metro Area on Saturday. **Active children and adults, and people with lung disease, such as asthma,** should reduce prolonged or heavy outdoor exertion in these areas between the hours of noon to 8 PM on Saturday.

This Action Day Alert will remain in effect until at least 4 PM Saturday, September 2, 2017.

September 2, 2017

COLORADO SMOKE OUTLOOK:

Saturday, September 2, 2017, 1:45 PM MDT

Widespread areas of haze are likely on Saturday and Sunday across Colorado due to smoke being transported from wildfires in the northwestern United States. No major health impacts are anticipated, however **Active children and adults, and people with lung disease, such as**

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asthma, should reduce prolonged or heavy outdoor exertion in these areas on Saturday and Sunday.

Front Range

Action Day for Multiple Pollutants

The Colorado Department of Public Health and Environment has issued an **ACTION DAY ALERT** at 4PM on Saturday, September 2, 2017 for the Front Range Urban Corridor from El Paso County north to Larimer and Weld counties, including the Denver-Boulder area, Colorado Springs, Fort Collins and Greeley.

Light winds, ample sunshine, and warm temperatures will promote ground-level ozone formation and Unhealthy for Sensitive Groups conditions are expected for the southern and western suburbs of the Denver Metro Area on Saturday. **Active children and adults, and people with lung disease, such as asthma**, should reduce prolonged or heavy outdoor exertion in these areas between the hours of noon to 8 PM on Saturday.

Smoke from wildfires being transported in from the northwestern portions of the U.S. and fires from Montana will cause increases in fine particulates and poor visibility. **Active children and adults, and people with lung disease, such as asthma**, should reduce prolonged or heavy exertion in these areas until at least 4 o'clock PM on Sunday.

This Action Day Alert will remain in effect until at least 4 PM Sunday, September 3, 2017.

September 3, 2017

COLORADO SMOKE OUTLOOK:

Sunday, September 3, 2017, 2:15 PM MDT

Areas of smoke and haze are likely on Sunday and Monday across Colorado due to smoke being transported from wildfires in the northwestern United States. Smoke is expected to improve Sunday evening and Monday morning but is expected to increase during the afternoon on Monday. No major health impacts are anticipated, however **Active children and adults, and people with lung disease, such as asthma**, should reduce prolonged or heavy outdoor exertion in these areas on Sunday and Monday.

Front Range

Action Day for Ozone

The Colorado Department of Public Health and Environment has issued an **ACTION DAY ALERT** at 4PM on Sunday, September 3, 2017 for the Front Range Urban Corridor from El Paso County north to Larimer and Weld counties, including the Denver-Boulder area, Colorado Springs, Fort Collins and Greeley.

Clear skies and warm temperatures accompanied by areas of smoke are expected to increase ground level ozone on Sunday and Monday. **Active children and adults, and people with lung disease, such as asthma,** should reduce prolonged or heavy outdoor exertion in these areas between the hours of noon to 8 PM on Sunday and Monday.

This Action Day Alert will remain in effect until at least 4 PM Monday, September 4, 2017.

September 4, 2017

COLORADO SMOKE OUTLOOK:

Air Quality Health Advisory for Wildfire Smoke

Issued for areas below 7000 ft. in eastern Colorado Issued at 9:30 AM MDT, Monday, September 4, 2017

Issued by the Colorado Department of Public Health and Environment

Affected Area: Areas below 7000 ft. in eastern Colorado. Locations include, but are not limited to Denver, Boulder, Ft. Collins, Greeley, Colorado Springs, Pueblo, Ft Morgan, Sterling, Julesburg, Holyoke, Boulder, Broomfield, Brighton, Littleton, Akron, Wray, Castle Rock, Kiowa, Hugo, Burlington, Cheyenne Wells, Ordway, Eads, La Junta, Las Animas, Lamar, Trinidad and Springfield

Advisory in Effect: 9:30 AM MDT, Monday, September 4, 2017 to 9:00 AM MDT, Tuesday, September 5, 2017

Public Health Recommendations: If smoke is thick or becomes thick in your neighborhood you may want to remain indoors. **This is especially true for those with heart disease, respiratory illnesses, the very young, and the elderly**. Consider limiting outdoor activity when moderate to heavy smoke is present. Consider relocating temporarily if smoke is

present indoors and is making you ill. **If visibility is less than 5 miles in smoke in your neighborhood, smoke has reached levels that are unhealthy.**

Outlook: Moderate to heavy smoke from fires in the northwestern US and western Canada is being transported into eastern Colorado. Smoke will slowly decrease Monday afternoon and evening, however due to the lingering health impacts of fine particulate concentrations we urge the public to continue to follow the health recommendations listed above through at least Tuesday morning.

Front Range

Action Day for Multiple Pollutants

The Colorado Department of Public Health and Environment has issued an **ACTION DAY ALERT FOR OZONE AND FINE PARTICULATES** at 4 PM on Monday, September 4, 2017 for the Front Range Urban Corridor from El Paso County north to Larimer and Weld counties, including the Denver-Boulder area, Colorado Springs, Fort Collins and Greeley.

Widespread wildfire smoke will result in ozone and fine particulate concentrations reaching the Unhealthy for Sensitive Groups category, and for some areas in the northern Front Range fine particulates will reach the higher Unhealthy category.

-- Fine particulate concentrations in the Unhealthy category are most likely for northern Front Range locations such as Ft. Collins, Greeley, Longmont and Boulder. In those areas, **People with heart or lung disease, older adults, and children** should avoid prolonged or heavy exertion until midnight Monday night, and then should reduce prolonged or heavy exertion through at least noon on Tuesday.

-- For all other Front Range locations, including Denver and Colorado Springs, **people with heart or lung disease, older adults, and children** should reduce prolonged or heavy exertion until at least noon on Tuesday.

-- Ozone concentrations in the Unhealthy for Sensitive Groups category on Sunday are most likely from the western suburbs of the Denver metro area northward along and near the foothills to Ft. Collins. Please refer to Fine Particulate Matter above for health recommendations on Monday and Tuesday.

This Action Day Alert will remain in effect until at least 4 PM Tuesday, September 5, 2017.

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Appendix E: Public **Comment**

According to 40 CFR 50.14(c)(3)(v), air agencies must "document [in their exceptional events demonstration] that the [air agency] followed the public comment process and that the comment period was open for a minimum of 30 days…." Further, air agencies must submit any received public comments to the EPA and address in their submission those comments disputing or contradicting the factual evidence in the demonstration.

APCD posted notice of this exceptional event demonstration on April 6, 2018 on the APCD website at: https://www.colorado.gov/pacific/cdphe/air-division-public-comment and https://www.colorado.gov/airquality/tech_doc_repository.aspx. Notice of the public comment period was also emailed to the Colorado Air Quality Control Commission, the Regional Air Quality Control Council, and APCD's permit email lists. Per verbal public request, APCD extended the public comment period to 5:00 p.m. on May 16, 2018, resulting in a public comment period of 40 days.

APCD received a total of seven comments on this exceptional event demonstration during the public comment period. These comments were received via e-mail between April 9 and May 16, 2018. Of these, five comments opposed APCD's request to exclude the ozone monitoring data listed in Table 2 of the demonstration from regulatory use. None of the comments challenged the technical merit of the demonstration. Two comments supported the demonstration and APCD's request to exclude ozone monitoring data from regulatory use. Elements of some comments were outside the scope of the Exceptional Events Rule and the technical demonstration. APCD's responses to the public comments are provided below.

In addition, the APCD made a number of formatting and spelling/grammatical changes to the document that were not substantive. The Division also added lines to Table 2 and Table 4 (which are duplicative) to show specific hours of data that are being requested for exclusion. This table was also added to the Conclusion section as Table 21.

Announcement of Public Comment Opportunity:

https://www.colorado.gov/pacific/cdphe/air-division-public-comment

CDPHE - Colorado | Exceptional Events | CDPHE Intranet | APACH | Webcast | CDPHE - Colorado | Urbanova_SCStreet | Colorado

COLORADO
Department of Public Health & Environment

Services & information | Boards & commissions | Divisions | Concerns & emergencies | Data | News | LPHAs

Air Pollution Control Division public comment

Back to Air Pollution Control Division topics

The following items are available for public comment:

- Permit public notices.
- September 2 and 4, 2017 Wildfire-influenced Ozone Exceptional Events.

Send comments or questions to: cdphe.commentsapcd@state.co.us. Please include your name and organization, if applicable.

https://www.colorado.gov/airquality/tech_doc_repository.aspx#exceptional_events

CDPHE - Colorado | Exceptional Events | CDPHE Intranet | APACH | Webcast | CDPHE - Colorado | Urbanova_SCStreet | Colorado

Exceptional Events

- Technical Support Document for the September 2 and 4, 2017, Ozone Exceptional Event
- Technical Support Document for the August 22, 2015, Lamar Exceptional Event
- Technical Support Document for the March 30, 2014, Alamosa Exceptional Event
- Technical Support Document for the April 8, 2013, April 23, 2013, May 1, 2013 and May 31, 2013 Alamosa Exceptional Events
- Technical Support Document for the April 16, 2013 Alamosa, Pagosa Springs, Durango and Crested Butte Exceptional Event
- Technical Support Document for the April 1, 2015 and April 2, 2015 Lamar Exceptional Events
- Technical Support Document for the May 26, 2012 and June 20, 2012 Alamosa Exceptional Events
- Technical Support Document for the March 11, 2014, March 15, 2014, March 18, 2014, March 29, 2014, March 30, 2014, March 31, 2014, April 23, 2014, April 29, 2014 and November 10, 2014 Lamar Exceptional Events
- Technical Support Document for the February 8, 2013, April 9, 2013, May 1, 2013, May 24, 2013, May 25, 2013, May 28, 2013 and December 24, 2013 Lamar Exceptional Events
- Technical Support Document for the November 10, 2012, Lamar Exceptional Event
- Technical Support Document for the April 02, 2012, Alamosa and Lamar Exceptional Event
- Technical Support Document for the March 18, 2012, Alamosa and Lamar Exceptional Event
- Technical Support Document for the February 28, 2012, Lamar Exceptional Event
- Technical Support Document for the February 23, 2012, Alamosa Exceptional Event
- Technical Support Document for the December 1, 2011, Alamosa Exceptional Event
- Technical Support Document for the April 3, 2011, Alamosa and Lamar Exceptional Event
- Technical Support Document for the November 5, 2011, Lamar Exceptional Event
- Technical Support Document for the April 16, 2013, Telluride Exceptional Event

April 9, 2018 Public Comment Notice Email to the APCD Permit Public Notice

Fwd: Ozone Exceptional Events Demonstration Public Comment Period

1 message

Niebergall - CDPHE, Alexandria <alexandria.niebergall@state.co.us> Mon, Apr 9, 2018 at 11:09 AM
To: Gordon Pierce - CDPHE <gordon.pierce@state.co.us>

Done!

--------- Forwarded message ---------
From: **Colorado Air Pollution Control Division** <alexandria.niebergall@state.co.us>
Date: Mon, Apr 9, 2018 at 9:57 AM
Subject: Ozone Exceptional Events Demonstration Public Comment Period
To: alexandria.niebergall@state.co.us

Hello,

On September 2 and September 4, 2017, ozone levels in the Denver Metro area were higher than the National Ambient Air Quality Standards. These ozone levels were influenced by smoke from a number of wildfires, and because of this, we have prepared an Exceptional Event demonstration to submit to the US EPA. This email is to let you know that our Exceptional Event demonstration is now available for comment until May 9, 2018 at 5:00 p.m..

Under federal regulation (40 CFR 50.14), we can request to have data that are directly due to an exceptional event to be excluded from use in air quality determinations. Accordingly, we have developed an Exceptional Event demonstration that we will submit to the U.S. EPA for ozone exceedances on select sites in the Denver metro area on these two days.

The demonstration "Technical Support Document for the September 2 and 4, 2017, Ozone Exceptional Event" is available on our website: https://www.colorado.gov/airquality/tech_doc_repository.aspx#exceptional_events.

Please send comments to cdphe.commentsapcd@state.co.us.

Thank you.

--

Alexandria Niebergall
Marketing and Communications Specialist II
Air Pollution Control Division

COLORADO
Air Pollution Control Division
Department of Public Health & Environment

P 303.692.3281 | F 303.782.5493
4300 Cherry Creek Drive South, Denver, CO 80246
alexandria.niebergall@state.co.us | www.colorado.gov/cdphe/apcd

Are you curious about ground-level ozone in Colorado? Visit our ozone webpage to learn more.

April 24, 2018 Public Comment Extension Email to the APCD Permit Public Notice Email List:

Fwd: Ozone Exceptional Events Demonstration Public Comment Period Extended

5 messages

Niebergall - CDPHE, Alexandria <alexandria.niebergall@state.co.us> Tue, Apr 24, 2018 at 2:43 PM
To: "Coffin - CDPHE, Richard" <richard.coffin@state.co.us>, "Colclasure - CDPHE, Chris" <chris.colclasure@state.co.us>, "Kaufman, Garry" <garrison.kaufman@state.co.us>, Gordon Pierce - CDPHE <gordon.pierce@state.co.us>

FYI - This email was went to the Permit Public Notice email list regarding an extension to the comment period for the O3 EE demonstration.

---------- Forwarded message ----------
From: **Colorado Air Pollution Control Division** <alexandria.niebergall@state.co.us>
Date: Tue, Apr 24, 2018 at 2:39 PM
Subject: Ozone Exceptional Events Demonstration Public Comment Period Extended
To: alexandria.niebergall@state.co.us

Hello,

On September 2 and September 4, 2017, ozone levels in the Denver Metro area were higher than the National Ambient Air Quality Standards. These ozone levels were influenced by smoke from a number of wildfires, and because of this, we have prepared an Exceptional Event demonstration we propose to submit to the US EPA. **This email is to let you know that the public comment period for our Exceptional Event demonstration has been extended to May 16, 2018 at 5:00p.m.**

Under federal regulation (40 CFR 50.14), we can request to have data that are directly due to an exceptional event to be excluded from use in air quality determinations. Accordingly, we have developed an Exceptional Event demonstration that we will submit to the U.S. EPA for ozone exceedances on select sites in the Denver metro area on these two days.

The demonstration "Technical Support Document for the September 2 and 4, 2017, Ozone Exceptional Event" is available on our website: https://www.colorado.gov/airquality/tech_doc_repository.aspx#exceptional_events.

Please send comments to cdphe.commentsapcd@state.co.us.

Thank you.

--

Alexandria Niebergall
Marketing and Communications Specialist II
Air Pollution Control Division

COLORADO
Air Pollution Control Division
Department of Public Health & Environment

P 303.692.3281 | F 303.782.5493
4300 Cherry Creek Drive South, Denver, CO 80246
alexandria.niebergall@state.co.us | www.colorado.gov/cdphe/apcd

Are you curious about ground-level ozone in Colorado? Visit our ozone webpage to learn more.

Public Comments Received:

Comment 1:

---------- Forwarded message ----------
From: **Phillip Doe** <ptdoe@comcast.net>
Date: Mon, Apr 9, 2018 at 11:31 AM
Subject: proposed exception from air quality standards from forest fires
To: cdphe.commentsapcd@state.co.us

It is patently ridiculous to ask for an exemption to the air quality standards because of out-state forest fires. A far better practice would be to footnote the reading, explaining forest fire contribution to the substandard air quality. Substandard is substandard no matter the cause. Will you next be asking for exceptions on other days when most of the VOCs helping to make up front-range ozone come from far away Weld County? I have a better suggestion, fine the hell out of Weld until the pollution comes down. Protect public health, not your embarrassment for our abysmal air quality along the front range, most of which come from the oil industry and without penalty. Stop the dithering and regulate to protect public health. We the people never gave the oil industry license to pollute without consequence.

Phil Doe
Environmental Director
Be the Change

Comment 2:

---------- Forwarded message ----------
From: <teresita1@bajabb.com>
Date: Wed, Apr 11, 2018 at 12:37 PM
Subject: PUBLIC COMMENT ON OZONE
To: cdphe.commentsapcd@state.co.us, "Teresita R." <teresita1@bajabb.com>

My name is Tess. I am presenting a Public Comment in Response to the Ozone Exceptional Event 30-day Public Comment Period.

I am from the community of LaPorte Colorado. The community is currently facing pollution problems from excessive surface mining and Industry in the 6-square mile area of LaPorte.

Aside from pollution from dust, the issue of Ozone Pollution and haze would be detrimental to the health and safety of the LaPortians.

I firmly believe that owing to the fact that Ozone can disperse hundred(s) of miles from where it is created and that LaPorte is less than 100 miles away, LaPorte stands in the way of potential exposure to harmful ozone levels.

My opinion is; that if inclusion of the ***Ozone Exceptional Event*** in considering ambient air quality values will help to protect the overburdened underserved LaPorte from further pollution, then I vote for the APCD **NOT TO EXCLUDE** THE ***Ozone Exceptional Event.***

Thank you for the opportunity to allow me the benefit of a Public Comment.

Tess

Comment 3:

---------- Forwarded message ---------
From: **America Sherwood** <americasherwood@yahoo.com>
Date: Sat, Apr 14, 2018 at 6:01 PM
Subject: Colorado Ozone Exceptional Events Demonstration Pubic Comment
To: cdphe.commentsapcd@state.co.us

My submission is as follows:

The CDPHE has listened to public testimony regarding Colorado's failing air quality for a couple of years now. I attended and testified at two hearings where many people gave testimony in regards to the Climate Change problem and its effects in Colorado. The burning of fossil fuels is creating carbon dioxide, methane and other greenhouse gases including ozone, that are warming the planet and causing Climate Change. Ozone is also used in fracking and in ozone machines which contribute to the toxic air quality that our Colorado families are forced to breathe. A vast amount of government agencies, scientific institutions and medical associations in the United States and world-wide concur on the major cause of Climate Change.

The current Colorado legislature has been given many opportunities this year and last to remedy the situation, but has failed to pass bills for our protection in spite of the many testimonies quoting studies, reports, positions that inform legislators about the science. The accountability aspect has not produced positive action to protect the public's health and safety. Accountability is not a priority.

A pending Colorado "Martinez" case appeal is being allowed and performed in order to avoid protecting Colorado citizens. And now, that this request for the state to be "excused" regarding forest fires, which adversely adds to the ozone problem, is being considered, is frankly, shameful. It shows a lack of integrity, accountability and responsibility which is owed to every taxpaying citizen. There must not be an "out" on this issue.There are consequences to be paid for doing nothing to remedy our state's reproachable behavior in not preventing this effect of Climate Change in our state.

This problem is predicted to increase and continue.The state must be made to pay the price for having reached such a tipping point which was foretold. Colorado will continue to experience fires due to drought, brought about by Climate Change and the inaction to solve the crisis is unforgivable. I totally object and do not agree with any directive to by-pass the National Ambient Air Quality Standard with an exemption as is being proposed. It is a crime to endanger public health and safety by all the current deniers in our Colorado leadership.

America Sherwood
7139 S. Elm Ct.
Centennial, CO. 80122
847.239.0236

Comment 4:

Boulder County

Public Health

Administration

May 10, 2018

Mr. Garry Kaufmann, Director
Air Pollution Control Division
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80246

Transmitted via email to cdphe.commentsapcd@state.co.us

Dear Mr. Kaufmann:

Thank you for allowing us the opportunity to comment on the Air Pollution Control Division's (APCD) "Exceptional Event Demonstration for Ozone on September 2 and 4, 2017." Our comments pertain not to the merit of the documentation that wildfires contributed to the ozone exceedances, but rather that wildfire should not be considered an exceptional event for Colorado and The West, and that we should focus our efforts on reducing overall ozone emissions.

We acknowledge that there is a clear, causal relationship between wildfire events and the monitored exceedances and resulting violation of the National Ambient Air Quality Standards (NAAQS); however, we question whether wildfires are exceptional events in today's climate. We urge the State of Colorado to no longer request that the U.S. Environmental Protection Agency (EPA) exclude exceptional events data due to wildfire.

As the 2018 Colorado Climate Plan notes, climate change has brought increased potential for more severe and frequent wildfires to Colorado.[1] In fact, climate projection scenarios predict extended periods of drought and higher temperatures, leading to increased incidence of wildfires. The Denver Metro/North Front Range (DM/NFR) is already in violation of both the 2008 (75 parts per billion [ppb]) and 2015 (70 ppb) ozone NAAQS. Discounting some of the measured high ozone values will minimize the urgency of taking more aggressive action to address the problem of ozone pollution.

For too many days in 2017 (as in past years), the health of people in the DM/NFR was negatively impacted because of ozone pollution. With wildfires and hot summer days projected to increase, we must shift our focus to regulatory strategies that will reduce emissions that we can control. This would result in overall ozone levels low enough that wildfire events wouldn't routinely cause exceedances and violations of the ozone NAAQS.

For example, exceedance levels during the September wildfire events with maximums at 76 ppb and 78 ppb were barely over the ozone standard. If the emission load from other sources were lower when those two events occurred, the ozone levels would've been below the level of the NAAQS, despite the added wildfire smoke.

Administration • 3450 Broadway • Boulder, Colorado 80304 • Tel: 303.441.1100 • Fax: 303.441.1452
www.BoulderCountyHealth.org

Under the EPA Exceptional Events Policy's Tier 2 analysis used by APCD, wildfire event ozone influences must be higher than non-event-related concentrations.[2] But, this is frequently not the case. The most recent ozone design value (i.e. average of the annual fourth highest daily 8-hour maximum, over a 3-year period) illustrates that non-event ozone levels are often higher; the highest recording monitors for 2015-2017 had design values of 79 ppb at the U.S. National Renewable Energy Laboratory (NREL) monitor and 77 ppb at the Rocky Flats North monitor, which were higher than the 76 ppb and 78 ppb requested to be excluded by APCD due to wildfire smoke.

We understand that the exceptional event exclusion prevents immediate reclassification in Colorado's DM/NFR ozone (O_3) nonattainment area from "moderate" to "serious" under the 2008 O_3 NAAQS for 2015-2017 data, and that it may also affect future nonattainment designations under the 2015 O_3 NAAQS.[3] However, because ozone levels are often elevated during the summer months in the absence of wildfire, we can better protect the health of our residents by taking action to reduce emissions of other ozone-forming pollutants.

In the APCD's exceptional event demonstration, the exceptional event rule summary includes the requirement that there is a public process for determining whether an event is exceptional.[4] In the interest of public health, now is the time for a meaningful discussion about whether wildfires should continue to be excluded by EPA on the State's request.

We encourage you to take the next step in protecting the public's health by committing to lowering the portion of the emissions we can control.

In health,

Jeff Zayach, M.S.
Director

cc: Mike Silverstein, Administrator and Technical Secretary, Colorado Air Quality Control Commission

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[1] Colorado Climate Plan: State Level Policies and Strategies to Mitigate and Adapt, 2018 Update.
[2] CDPHE, Exceptional Event Demonstration for Ozone on September 2 and 4, 2017, April 5, 2018 at 4, table 3.
[3] CDPHE at 5.
[4] CDPHE at 2.

Comment 5:

Colorado Petroleum Council

Submitted via email to cdphe.commentsaped@state.co.us

May 15, 2018

Mr. Garrison Kaufman
Director, Air Pollution Control Division
Colorado Department of Public Health and the Environment
4300 Cherry Creek Drive South
Denver, CO 80246

Re: Colorado Petroleum Council's Public Comments on APCD's Technical Support Document for the September 2 and 4, 2017 Ozone Exceptional Events

Dear Mr. Kaufman:

The Colorado Petroleum Council (CPC) is providing its written comments in support of the Air Pollution Control Division's (APCD) report entitled "Exceptional Event Demonstration for Ozone on September 2 and 4, 2017" and dated April 5, 2018.

CPC is a division of the American Petroleum Institute and represents all facets of the oil and natural gas industry in Colorado. CPC and its member companies are committed to ensuring a strong, viable oil and natural gas industry capable of meeting the energy needs of Colorado in a safe and environmentally responsible manner.

EPA Clean Air Act regulations in 40 CFR Part 50.14 allow air quality monitoring data showing exceedances of violations of any national ambient air quality standard (NAAQS) to be excluded from consideration if a technical demonstration can clearly support that the exceedance or violation was influenced by an exceptional event. Specifically, 40 CFR Part 50(b)(4) allows EPA to exclude data from use in determinations of exceedances or violations due to emissions from wildfires as an exceptional event.

EPA defines an exceptional events in 40 CFR Part 50.1 as: *an event(s) and its resulting emissions that affect air quality in such a way that there exists a clear causal relationship between the specific event(s) and the monitored exceedance(s) or violation(s), is not reasonably controllable or preventable, is an event(s) caused by human activity that is unlikely to recur at a particular location or a natural event(s), and is determined by the Administrator in accordance with 40 CFR 50.14 to be an exceptional event. It does not include air pollution relating to source noncompliance. Stagnation of air masses and meteorological inversions do not directly cause pollutant emissions and are not exceptional events. Meteorological events involving high temperatures or lack of precipitation (i.e., severe, extreme or exceptional drought) also do not directly cause pollutant emissions and are not considered exceptional events. However, conditions*

involving high temperatures or lack of precipitation may promote occurrences of particular types of exceptional events, such as wildfires or high wind events, which do directly cause emissions. means an event(s) and its resulting emissions that affect air quality in such a way that there exists a clear causal relationship between the specific event(s) and the monitored exceedance(s) or violation(s), is not reasonably controllable or preventable, is an event(s) caused by human activity that is unlikely to recur at a particular location or a natural event(s), and is determined by the Administrator in accordance with 40 CFR 50.14 to be an exceptional event. It does not include air pollution relating to source noncompliance. Stagnation of air masses and meteorological inversions do not directly cause pollutant emissions and are not exceptional events. Meteorological events involving high temperatures or lack of precipitation (i.e., severe, extreme or exceptional drought) also do not directly cause pollutant emissions and are not considered exceptional events. However, conditions involving high temperatures or lack of precipitation may promote occurrences of particular types of exceptional events, such as wildfires or high wind events, which do directly cause emissions.

CPC supports the APCD's determination in its report referenced above that the smoke from extensive wildfires in the northwestern United States and prevailing wind conditions resulted in transport of ozone precursors to Colorado's Denver Metro/Northern Front Range ozone nonattainment area causing a drastic increase in ozone concentrations at several of the ozone monitoring sites on September 2, 2017 and two days later on September 4, 2017. The meteorological and air quality data and analysis presented in this report is compelling in demonstrating the smoke plumes generated by these wildfires were responsible for the high ozone levels measured at several monitors on these dates. These wildfires that occurred outside of Colorado yet impacted air quality in Colorado due to meteorological conditions on these dates, clearly constitute exceptional events.

CPC believes APCD's report should be approved by EPA in excluding the ozone data gathered at several monitoring sites on these dates to be excluded from use in making determinations of exceedances or violations of NAAQS.

Thank you for the opportunity to provide these comments.

Sincerely,

Michael Paules
Associate Director
Colorado Petroleum Council

cc: Tracee Bentley, Executive Director of Colorado Petroleum Council

Comment 6:

COLORADO
OIL & GAS
ASSOCIATION

1800 GLENARM PL.
SUITE 1100
DENVER, CO 80202
Phone 303.861.0362
Fax 303.861.0373
WWW.COGA.ORG

May 16, 2018

VIA EMAIL – NO ORIGINAL TO FOLLOW

Garry Kaufman
Director, Air Pollution Control Division
Colorado Department of Public Health and Environment
4300 Cherry Creek S Dr
Denver, Colorado 80246

RE: Colorado Oil & Gas Association – Comments to Exceptional Event Demonstration for Ozone on September 2 and 4, 2017

Dear Mr. Kaufman,

The Colorado Oil & Gas Association ("COGA") respectfully submits this letter in support of the "Exceptional Event Demonstration for Ozone on September 2, and 4, 2017" issued for public comment on April 6, 2018 by the Colorado Air Pollution Control Division ("APCD" or "Division"). As a preliminary matter, COGA's support of this demonstration should not be construed as an indication of support for the current exceptional events policy and regulations, which are far too burdensome. 108 pages and nearly 6 months is not necessary to demonstrate what was clearly a wildlife exceptional event.

For over 30 years, COGA has fostered and promoted the beneficial, efficient, responsible, and environmentally sound development, production, and use of Colorado's oil and natural gas resources for the betterment of society. With over 275 members, COGA provides a positive, proactive voice for the oil and gas industry in Colorado and aggressively promotes the expansion of Rocky Mountain natural gas markets, supply, and transportation infrastructure.

Over the years, COGA members have tirelessly worked with the Division and other stakeholders on air quality matters, including ozone planning. This engagement, combined with regulatory measures and industry innovations, have contributed to the improved air quality in Colorado. Ozone levels in the Denver North Front Range Non-Attainment Area ("NAA") continue to improve even while oil production has more than tripled since 2010 and gas production remained relatively constant during the same time. While there are many industrial sectors and sources that contribute to ozone formation, the oil and gas industry, alone, has reduced Volatile Organic Compound ("VOC")

emissions by more than 50% from 2011-2017 as reflected in the most recent emissions inventory.

In September 2017 out of state wildfires caused exceedances to ozone monitors that threaten to undermine the work many Colorado stakeholders have done to minimize ozone levels in the NAA. Fortunately, such a circumstance has been contemplated. Under Federal Regulation 40 CFR 50.14, the APCD can request to have data that is directly due to such an exceptional event be excluded from use in air quality determinations of exceedances of the National Ambient Air Quality Standards ("NAAQS"). The Division has done just that in its submission of an exceptional events demonstration.

The APCD has prepared a thorough and robust exceptional events demonstration as a consequence of wildfires in the northwestern United States. As the demonstration states, in September 2017 numerous wildfires in the Pacific Northwest, Wyoming, Idaho and Montana generated high levels of ozone precursors and concentrations that were transported into the NAA by prevailing winds. These fires caused ozone exceedances at four monitoring sites on September 2, 2017 and six monitoring sites on September 4, 2017 in Colorado (see Table 2). The APCD demonstration contains compelling data and analysis that concludes these exceedances are a result of the numerous wildfires in the northwestern United States, which transported smoke to the southeast and caused increased ozone concentrations in the northern Front Range region of Colorado. This data constitutes an exceptional event and should be excluded from EPA NAAQS determinations.

The evidence provided in the Division's 108-page demonstration clearly satisfies the exceptional event criteria: the event was a natural event, which affected air quality in such a way that there exists a clear causal relationship between the event and monitored exceedances, and was not reasonable controllable or preventable. Accordingly, COGA supports the Division's exceptional events demonstration, and requests EPA Region 8 concur and exclude the above referenced September 2 and September 4 Ozone monitoring data from NAAQS determinations.

Sincerely,

Andrew Casper
Director of Legal & Regulatory Affairs
Colorado Oil & Gas Association

Comment 7:

CENTER for BIOLOGICAL DIVERSITY Because life is good.

VIA E-MAIL

May 16, 2018

Mr. Garry Kaufmann, Director
Air Pollution Control Division
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80246
cdphe.commentsapcd@state.co.us.

RE: Exceptional Event Demonstration for Ozone on September 2 and 4, 2017

Dear Director Kaufmann:

On behalf of the Center for Biological Diversity and our tens of thousands of members and supporters who are hurt by ozone and its precursor pollutants from the Metro-Denver/Northern Front Range (Northern Front Range) 2008 ozone national ambient air quality standard (NAAQS) moderate nonattainment area. For the reasons explained below, we urge you to not submit the exceptional event demonstration to the United States Environmental Protection Agency (EPA). Rather, EPA should request submit a request to EPA asking to have the Northern Front Range nonattainment area be bump up to the serious classification for the 2008 ozone NAAQS.

The Air Pollution Control Division's attempt to designate the September 2 and 4, 2017 ozone values as exceptional events is morally and legal unjustifiable. The Division has admitted that it has illegally delayed creating reasonably available control technology (RACT) rules for various combustion sources in the Northern Front Range nonattainment area. The Division claims that its delay in creating these lifesaving protective measures is because of limited resources. However, the Division is spending tens or hundreds of thousands of tax payer dollars on attempting to obtain an exception event concurrence from EPA for September 2 and 4, 2017. Spending all this money will not result in any control of air pollution by the Division. It will not create any protection for Colorado's public health and the environment. It should be painfully obvious that taking actions contrary to the very name of your agency is not the course of action to pursue. Rather, the Division should not spend another penny on this wasteful and hurtful exceptional event effort. Rather, the funds should be used to quickly develop RACT protective measures to protect the public health and environment of Colorado. Developing these RACT rules will also help Colorado to reduce nitrogen deposition into Rocky Mountain National Park, which the Division acknowledges is currently exceeding

the acceptable level. This exceedance will require more regulatory work by the Division. However, the Division is under the misguided belief that it should delay addressing nitrogen deposition into our majestic park until utterly forced to. Similarly, the Northern Front Range was recently designated a marginal nonattainment area for the 2015 ozone NAAQS. Spending taxpayer money on RACT rules, not exceptional event excuses, is the path forward to resolving the excess nitrogen deposition into Rocky and the 2015 ozone NAAQS nonattainment designation as well as the 2008 ozone NAAQS nonattainment designation. In addition to keeping Colorado children and adults from being poisoned, it is the most efficient use of resources which the Division has been entrusted with.

Recently, the state of California has requested that Eastern Kern County be "bumped up" from a moderate to a serious nonattainment area for the 2008 ozone NAAQS. 83 Fed. Reg. 22,235 (May 14, 2018). The Division, and the Air Quality Control Commission, should follow California's lead and request that EPA bump up the Northern Front Range 2008 ozone NAAQS nonattainment area to the serious level to protect public health and the environment in Colorado, as well as minimize the Division's expenses and maximizing available tools to address the 2015 ozone NAAQS nonattainment area, "Good Neighbor" provisions, round 2 of the Regional Haze Requirements, as well as nitrogen deposition into Rocky Mountain National Park.

Turning to the legal requirements, exceptional events do not include man made events that are reasonably controllably. There is no evidence in the record to establish that the forest fires which may have contributed to the September 2 and 4, 2017 ozone readings are not man made. It is well established that climate change is caused by human emissions of greenhouse gases. It is equally well established that climate change is causing a change in the forest fire patterns in the American West. This includes a long fire season, and increased fire intensity and frequency. Past human policies on fire suppression also contributes greatly to forest fires and their intensity. The Division would need to establish that climate change and fire suppression where not the cause of emissions from forest fires contributing to ozone values in Colorado on September 2 and 4, 2017. However, we strongly discourage the Division from heading down this path for the reasons explained above. Rather, the Division should be working to protect people and public lands, not polluters' profits.

Furthermore, climate change is easily preventable and controllable. Current technology allows Colorado to generate electricity from sources which emit no greenhouse gases for less than the fossil fuels. Yet Colorado currently gets its electricity from the 19th century, expensive and dirty technology of burning coal. While Colorado switching to clean energy is not sufficient to solve climate change, it is necessary and Colorado has not done it. Thus, the forest fires the Division is using as an excuse to protect people in Colorado from ozone pollution are not creditable.

Furthermore, massive, intense forest fires are controllable and preventable by allowing the return of natural fire regimes in forests combined with true catastrophic fire

mitigation. By true mitigation, we mean activities actually meant to mitigate fires rather than commercial timber projects conducted under the false label of fire mitigation.

Finally, we note that the exception event rule is currently being challenged in the U.S. Court of Appeals for the District of Columbia Circuit. We reserve the right to submit additional comments should the rule be remanded and vacated in whole or part.

Therefore, for the reasons explained above, we request that the Division abandon its efforts to obtain an exceptional event concurrence or that the Commission instruct them to do so, combined with a request for a voluntary "bump up" to serious for the 2008 ozone NAAQS.

Sincerely,

Robert Ukeiley
Senior Attorney – Environmental Health
Center for Biological Diversity
1536 Wynkoop St., Ste. 421
Denver, CO 80202
(720) 496-8568
rukeiley@biologicaldiversity.org

Division Response:

The Colorado Air Pollution Control Division (Division or APCD) appreciates the time and effort that each commenter took to develop their comments. Due to the overlap between the issues raised in the comments, the Division is providing this consolidated response to address all the comments received. This document compiles and summarizes the written comments received during the public notice period and is organized by topic area. The Division's responses to comments are provided below:

1. **Ambient Ozone Concentrations**

Summary of comments: Some letters commented on the scale of the wildfires' influence in relation to ambient ozone concentrations. One comment stated that "Under the EPA Exceptional Events Policy's Tier 2 analysis used by the Division, wildfire event ozone influences must be higher than non-event-related-concentration. But, this is frequently not the case."

Response: Exceptional event demonstrations must compare the event-related ozone concentrations with similar seasonal non-event-related high ozone concentrations, but there is no requirement for the event-related concentrations to be higher than all non-event-related concentrations. Section 3.5.1 of EPA's Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations (September 2016) ("Guidance") explains that for Tier 2 analyses, "key Factor #2 involves showing that the exceedance due to the exceptional event is in the 99th percentile of the 5-year distribution of O_3 monitoring data, or is one of the four highest O_3 concentrations within 1 year." Section 4.2.3 (Historical Fluctuations of O3 Concentrations in the DM/NFR Area) of CDPHE's Exceptional Event Demonstration for Ozone on September 2 and 4, 2017 (April 5, 2018) ("Demonstration") satisfies the criteria for Key Factor #2. Table 14 shows that all of the data recommended for exclusion is in the 99th percentile, except for the Rocky Flats North data. However, as an allowable alternative test, the diurnal hourly data for Rocky Flats North show historical maximum hourly values for September for these dates. Table 17 shows that the September 2, 2017 data from NREL and Welch, and the September 4, 2017 data from Aspen Park, NREL and Rocky Flats North, were among the top four concentrations of the year.

Summary of comments: Several comments pointed to the health risks of elevated ozone concentrations. One comment pointed out that the DM/NFR area is already in violation of the 2008 and 2015 ozone National Ambient Air Quality Standards (NAAQS). This comment and others encouraged the Division to take action to reduce ozone and ozone precursors.

Response: The Division agrees that elevated ozone levels harm public health and that the DM/NFR area is designated nonattainment for the 2008 and 2015 ozone NAAQS. The DM/NFR was designated a nonattainment area under the 2008 standard with an effective date of July 20, 2012 (77 Fed. Reg. 30088) and reclassified from marginal to moderate effective June 3, 2016 (81 Fed. Reg. 26697). EPA Administrator Pruitt signed a rule on April 30, 2018 designating the DM/NFR as a nonattainment area under the 2015 NAAQS and classifying it as marginal (Federal Register publication pending). Colorado has extensive programs in place to reduce ozone concentrations, protect public health, and attain the ozone NAAQS. Sections 7.3 and 7.4 of the Moderate Area Ozone State Implementation Plan (SIP) for the Denver Metro and North Front Range Nonattainment Area (approved November 17, 2016) describe 25 distinct ozone strategies that Colorado is implementing. Seven of these strategies are incorporated in

the SIP. The Division continues to evaluate ozone concentrations and refine its ozone control strategies.

2. Treatment of Wildfires as Exceptional Events

Summary of comments: One comment argued that the air quality data from September 2 and 4, 2017 should not be excluded because "exceptional events do not include man made events that are reasonably controllably [sic];" that climate change has increased fire intensity and frequency but "climate change is easily preventable and controllable;" and that "forest fires are controllable and preventable" through fire mitigation.

Response: An emissions event that is "reasonably controllable or preventable" does not meet the definition of an exceptional event. 40 C.F.R. 50.1(j). However, as Section 5.1 of the EPA Guidance explains, "it is presumptively assumed that wildfires on wildland will satisfy both factors of the 'not reasonably controllable or preventable' element unless evidence in the record clearly demonstrates otherwise." Sections 4, 6, and Appendix C of the Division's Demonstration notes that of the twenty-eight wildfires considered, twenty-four were caused by lightning or a natural cause, four have an unknown cause, and all occurred on wildland. Section 6.0 of the Demonstration details that the Division is not aware of any evidence clearly demonstrating that prevention or control efforts beyond those actually made would have been reasonable. The Division concludes that emissions from these wildfires were not reasonably controllable or preventable. The Division changed the internal cross reference in Section 6.0 from "Appendix B" to "Appendix C."

Summary of comments: Some comments argued that the wildfires under consideration were not natural events because anthropogenic climate change, historic fire suppression practices, or other human activity has made wildfires more frequent and more severe. One comment stated "[t]here is no evidence in the record to establish that the forest fires which may have contributed to the September 2 and 4, 2017 ozone readings are not man made."

Response: The Exceptional Events Rule (EER) and EPA's Guidance make it clear that air quality data influenced by wildfires on wildlands are eligible for exclusion. The definition of an exceptional event includes "an event(s) caused by human activity that is unlikely to recur at a particular location or a natural event(s)." 40 C.F.R. 50.1(j). The EER defines a natural event as "an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role." 40 C.F.R. 50.1(k). The rule defines a wildfire as "any fire started by an unplanned ignition caused by lightning; volcanoes; other acts of nature; unauthorized activity; or accidental, human-caused actions, or a prescribed fire that has developed into a wildfire. A wildfire that predominantly occurs on wildland is a natural event." 40 C.F.R. 50.1(n). Furthermore, the preamble to the EER states that "wildfires on wildland initiated by accident or arson are considered natural events." 81 Fed. Reg. 68233, n. 35.

The Demonstration shows that the wildfires under consideration are natural events. Each of the fires was caused by lightning, natural causes, or unknown causes. Demonstration Tables 11 and 12. They were not categorized as human-caused by the forestry and fire management agencies that are authorized to prevent, suppress, and investigate these wildfires. Demonstration Appendix C. Each of the fires occurred on wildland. Demonstration Sections 5.0, 6.0 and Appendix C. The fires are therefore natural events under 40 C.F.R. 50.1(n). The Division is not aware of any evidence that climate change, fire suppression practices, or other

human activity was a factor in these particular wildfires. If human activity played a role in these particular wildfires, the human activity was at most an indirect cause, and therefore the wildfires were natural events under 40 C.F.R. 50.1(k). Even if the wildfires could be considered to be directly caused by human activity, they would still be eligible for exclusion under the EER because they are unlikely to recur at a particular location. 40 C.F.R. 50.1(j).

3. Opposition to and Support of Reliance on the Exceptional Events Rule

Summary of comments: Some comments encouraged the Division to reduce ozone concentrations rather than submitting an exceptional events Demonstration. These comments emphasized the need to protect public health, the role of industry in causing emissions, a desire for more aggressive action to address ozone, and the resources required to prepare exceptional event demonstrations. Other comments supported the Demonstration and stated it should be approved by EPA.

Response: The Division is implementing numerous ozone control strategies and will continue to do so, as stated elsewhere in this response document. The Clean Air Act and the EER allow the exclusion of air quality monitoring data influenced by exceptional events from use in determining attainment of the NAAQS. As presented in Table 1 of the Demonstration, the Division has provided information satisfying all of the EER requirements. As shown in the Demonstration, wildfire smoke from numerous wildfires in the Pacific Northwest, Wyoming, Idaho and Montana were transported to the DM/NFR area, resulting in ozone exceedances beyond the regulatory control of the Division. The Division considered all of the public comments and will continue forward in submitting the Exceptional Event Demonstration to the EPA.

4. Other Comments

Summary of comments: Some comments expressed concern about climate change, ongoing litigation involving the Colorado Oil and Gas Conservation Commission, nitrogen deposition, and whether commercial timber projects should be viewed as a true fire mitigation measure. One comment encouraged the Division to request voluntary reclassification of the DM/NFR as a serious ozone nonattainment area.

Response: These issues are outside the scope of the proposed action, but the Division notes that it has programs in place to reduce nitrogen deposition in Rocky Mountain National Park and to reduce greenhouse gas emissions. Comments that these issues render wildfires unexceptional by increasing their frequency and severity are addressed elsewhere.

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