

2015 Addendum to the Request for EPA Concurrence as Exceptional Events for 2012 Wildfire Impacts on PM_{2.5} Monitor Values at Salmon and Pinehurst Idaho

Draft



**State of Idaho
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Executive Summary

On December 6, 2013, the Idaho Department of Environmental Quality (DEQ) submitted a *Request for EPA Concurrence as Exceptional Events for 2012 Wildfire Impacts on PM_{2.5} Monitor Values at Salmon and Pinehurst Idaho* including all elements required in a demonstration under the Exceptional Events Rule (EER) in 40 CFR 50 and 51 (72 FR 13560). Due to limited resources, DEQ only included monitor values that ensured that the Pinehurst design value (2010–2012) with respect to the annual National Ambient Air Quality Standard (NAAQS) for PM_{2.5} (fine particulate matter) was below 12 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

Since that original submittal, the US Environmental Protection Agency (EPA) issued final designations for the annual PM_{2.5} NAAQS based on 2011–2013 data. The West Silver Valley (WSV) was designated as nonattainment on January 15, 2015 (effective April 15, 2015). Now that the WSV has been designated nonattainment, DEQ has reviewed all the days during the 2012 wildfire season for Pinehurst and is including all days that meet the requirements for exceptional events. The exclusion of these additional days is necessary to ensure the most appropriate design value is used when developing the State Implementation Plan for the West Silver Valley Nonattainment Area.

This addendum includes additions for 19 new monitoring days for the Pinehurst monitor. The following tables in the original submittal, as they relate to the Pinehurst monitor, should be replaced or modified by the corresponding tables in this addendum as indicated. The new information in the tables is shaded. Note that some of these tables were previously modified by a 2014 addendum addressing the Salmon monitor. Section 4.3.7, “Industrial Sources in Pinehurst,” should be added to the original submittal and is applicable to all days included in this addendum. The information included in Appendix C in this addendum should be added to Appendix C in the original submittal. Any reference to page numbers, appendices, or references refer to the original submittal unless otherwise noted. The remainder of the original submittal remains unchanged except as modified by the 2014 addendum.

- **Table A.** An additional 19 values are included in this table showing Pinehurst monitor values for which DEQ is requesting EPA concurrence as exceptional events. Replace the information related to Pinehurst in the original submittal with this information. Note that a previous addendum for the Salmon monitor (April 25, 2014) updated this table.
- **Table 9.** An additional 19 days are included in this table showing the percentile ranking for Pinehurst PM_{2.5} monitor values.
- **Section 4.3.7, Industrial Sources in Pinehurst.** This is a new subsection added to Section 4.3 (Alternative Hypotheses) discussing PM_{2.5} emissions from industrial sources in and around Pinehurst. A previous addendum for the Salmon monitor (April 25, 2014) added Section 4.3.6 (Industrial Sources); however, it only considered those in the Salmon area.
- **Table 11.** An additional 19 days are included in this table showing the estimated contribution of Pinehurst values that would not have occurred “but for” the 2012 wildfires.
- **Appendix A.** An additional 19 days are included in Table A-2 that show the Pinehurst monitor values and whether they were included in the original submittal or this

addendum. A previous addendum for the Salmon monitor (April 25, 2014) updated this table.

- **Appendix C.** An additional 19 two-page summaries were added providing a complete, yet concise summary of the EER evidence available for each day requested in this addendum.
- **Appendix D.** Added distance and direction from the Pinehurst monitor in Table D-2 and D-3 for the prescribed burns in Idaho and Western Montana, respectively. Based on the Montana/Idaho Airshed Group database, accessed March 14, 2014, to verify that all burns from July 1 through October 12 are included, none were close enough to impact the Pinehurst monitor on the days requested in this addendum. A previous addendum for the Salmon monitor (April 25, 2014) updated this table.
- **Appendix E.** Included an additional 3 days to be added to Table 14 that show whether a Stage 1 Forecast and Caution was in effect for Salmon and Pinehurst. These days should be added to the table included in the previous addendum (April 25, 2014).

Table A. Monitor values for which DEQ is requesting EPA concurrence (EPA 2013b).

Pinehurst, Shoshone County Idaho Monitor Site AQS 16-079-0017	
Date	POC 4 Daily Mean PM_{2.5} Concentration (µg/m³)
8/14/2012	18.6
8/26/2012	16.5
8/27/2012	17.6
8/28/2012	13.8
9/14/2012	31.3
9/15/2012	43.6
9/16/2012	17.7
9/19/2012	19.9
9/20/2012	30.4
9/21/2012	16.2
9/22/2012	20.8
9/23/2012	22.8
9/24/2012	22.4
9/25/2012	18.4
9/26/2012	20.2
9/27/2012	18.5
9/28/2012	20.0
9/29/2012	15.8
10/1/2012	22.4
10/2/2012	14.1
10/7/2012	14.4
10/8/2012	26.6
10/9/2012	22.2

Note: POC4 = Primary, FDMS Monitor Values

Table 9. Percentile rankings for Pinehurst PM_{2.5} monitor values, relative to unaffected days in the same period from 2008–2011 (99% indicates 99% or above).

Date	PM _{2.5}	Percentile (Annual)	Percentile (Season)
9/15/2012	43.6	99%	99%
9/14/2012	31.3	95%	99%
9/20/2012	30.4	94%	99%
10/8/2012	26.6	90%	99%
9/23/2012	22.8	86%	99%
9/24/2012	22.4	85%	99%
10/1/2012	22.4	85%	99%
10/9/2012	22.2	85%	99%
9/22/2012	20.8	83%	99%
9/26/2012	20.2	82%	99%
9/28/2012	20.0	82%	99%
9/19/2012	19.9	81%	99%
8/14/2012	18.6	79%	99%
9/27/2012	18.5	78%	99%
9/25/2012	18.4	78%	98%
9/16/2012	17.7	76%	98%
8/27/2012	17.6	76%	98%
8/26/2012	16.5	75%	97%
9/21/2012	16.2	74%	97%
9/29/2012	15.8	73%	96%
10/7/2012	14.4	69%	94%
10/2/2012	14.1	69%	93%
8/28/2012	13.8	68%	93%

Section 4.3.7. Industrial Sources in West Silver Valley Area

Very few permitted industrial sources are located in Shoshone County. There are no permitted sources operating in the City of Pinehurst or the Pine Creek area. The table below summarizes the permitted industrial sources located within the West Silver Valley Nonattainment Area that were operational during the 2012 wildfire season (July–October). With the exception of the school, these facilities operate year-round on a consistent basis. The school operates the boiler to heat the school every year during the fall, winter, and spring. The industrial facilities in the West Silver Valley area are minor sources of PM_{2.5} and PM_{2.5} precursors, and their emissions are reflected in the normal historical fluctuations presented in Section 3.2 (not included in this addendum). All facilities are required to submit excess emission reports in accordance with IDAPA 58.01.01.130–136. There were no excess emission reports from these facilities during the 2012 wildfire season. Therefore, no unusual industrial source activity contributed to increased PM_{2.5} during the 2012 wildfire season.

Shoshone County industrial sources.

Type and Number of Facilities	Location	Type of Emissions
3 automotive coating facilities	Kellogg	Volatile organic compounds (VOCs) and very little PM _{2.5}
2 wood products facilities	Kellogg/North Fork	VOCs and less than 10 tons/year of PM ₁₀ (total potential to emit [PTE] for both facilities)
1 crematory	Kellogg	Less than 0.5 tons/year of PM ₁₀ (PTE)
School (boiler used for heating)	Kellogg	Less than 0.5 tons/year of PM ₁₀ (PTE)

Table 11. Estimated contribution of Pinehurst values that would not have occurred “But For” the 2012 wildfires. The two right-hand columns represent the range of concentration contributed by wildfires.

Date	PM _{2.5} Value at Monitor (µg/m ³)	Value – 95 th Percentile (µg/m ³)	Value – Average (µg/m ³)
9/15/2012	43.6	28.6	36.6
9/14/2012	31.3	16.3	24.3
9/20/2012	30.4	15.4	23.4
10/8/2012	26.6	11.6	19.6
9/23/2012	22.8	7.8	15.8
9/24/2012	22.4	7.4	15.4
10/1/2012	22.4	7.4	15.4
10/9/2012	22.2	7.2	15.2
9/22/2012	20.8	5.8	13.8
9/26/2012	20.2	5.2	13.2
9/28/2012	20.0	5	13
9/19/2012	19.9	4.9	12.9
8/14/2012	18.6	3.6	11.6
9/27/2012	18.5	3.5	11.5
9/25/2012	18.4	3.4	11.4
9/16/2012	17.7	2.7	10.7
8/27/2012	17.6	2.6	10.6
8/26/2012	16.5	1.5	9.5
9/21/2012	16.2	1.2	9.2
9/29/2012	15.8	0.8	8.8
10/7/2012	14.4	0	7.4
10/2/2012	14.1	0	7.1
8/28/2012	13.8	0	6.8

Appendix A. Monitor Values

Date	Pinehurst POC 4 (Primary) PM _{2.5} (µg/m ³)	Values included in Dec. 6, 2013, Request and Concurred by EPA	Values included in this addendum
8/14/2012	18.6		Yes
8/15/2012	4.6		
8/16/2012	3.7		
8/17/2012	4		
8/18/2012	5.3		
8/19/2012	6		
8/20/2012	7.8		
8/21/2012	6.4		
8/22/2012	4		
8/23/2012	2.7		
8/24/2012	1.7		
8/25/2012	1.9		
8/26/2012	16.5		Yes
8/27/2012	17.6		Yes
8/28/2012	13.8		Yes
8/29/2012	3.1		
8/30/2012	1.8		
8/31/2012	6.4		
9/1/2012	4.6		
9/2/2012	2.4		
9/3/2012	2.8		
9/4/2012	1.7		
9/5/2012	3.8		
9/6/2012	1.5		
9/7/2012	2.6		
9/8/2012	5.2		
9/9/2012	7.9		
9/10/2012	8.9		
9/11/2012	10.9		
9/12/2012	4.3		
9/13/2012	4.3		
9/14/2012	31.3	Yes	
9/15/2012	43.6	Yes	
9/16/2012	17.7		Yes
9/17/2012	7.4		
9/18/2012	4.6		
9/19/2012	19.9		Yes
9/20/2012	30.4		Yes

Date	Pinehurst POC 4 (Primary) PM_{2.5} (µg/m³)	Values included in Dec. 6, 2013, Request and Concurred by EPA	Values included in this addendum
9/21/2012	16.2		Yes
9/22/2012	20.8	Yes	
9/23/2012	22.8		Yes
9/24/2012	22.4		Yes
9/25/2012	18.4	Yes	
9/26/2012	20.2		Yes
9/27/2012	18.5		Yes
9/28/2012	20.0		Yes
9/29/2012	15.8		Yes
9/30/2012	8.7		
10/1/2012	22.4		Yes
10/2/2012	14.1		Yes
10/3/2012	4.9		
10/4/2012	7.7		
10/5/2012	10.9		
10/6/2012	12.1		
10/7/2012	14.4		Yes
10/8/2012	26.6		Yes
10/9/2012	22.2		Yes
10/10/2012	20.2		
10/11/2012	24.2		
10/12/2012	18.4		

Appendix C. Pinehurst EER Daily Summaries—Addendum

Information for this Appendix

This appendix contains day-by-day detailed information in support of the exceptional events request for each day requested, including the monitor values, AQS number, and POC for each value on which DEQ is requesting concurrence. Explanations follow for the information contained in this appendix.

Summary of EER Evidence Tables

These tables contain concise, yet complete information supporting each Exceptional Event Rule (EER) element for each day in which EER concurrence is requested, along with reference to the main report section containing more complete explanations of the transport scenarios involved, alternative hypotheses, and other EER elements.

HYSPLIT Back-trajectories / MODIS Satellite Images

Daily satellite images are overlaid with HYSPLIT back trajectories and HMS fire detects. Terra (morning) or Aqua (afternoon) RGB true color images show a snapshot of the smoke at the time of the satellite pass. HYSPLIT back-trajectories were run for the 24-hour period ending at 23:59 on each day. New trajectories start hourly and have starting positions at the source of 0 meters (m) above ground level (agl), 500 m agl, and 1,000 m agl. HMS fire detects are all those identified by the MODIS satellites during the 24-hour period.

Time Series Charts for each “Date” Requested

Twenty-four hour time series charts are provided to depict the temporal pattern of hourly $PM_{2.5}$ concentration and meteorological parameters associated with each day. In addition, typical $PM_{2.5}$ concentrations during the same month in previous years when wildfires were not impacting Pinehurst are characterized for comparison.

Top chart: $PM_{2.5}$ with Average and 95th Percentile for Month (2009–2011)

2012 $PM_{2.5}$ —The red circles and line indicate the hourly $PM_{2.5}$ concentration for each hour for each day affected by wildfires in 2012.

August/September/October Average—The blue line with filled blue triangle markers represents the average for the month for the 3 years prior to 2012. So each value represents 90 or 93 values averaged together. The October average only represents the days prior to October 15, to better represent the wildfire period.

August/September/October 95th percentile—The open blue triangles and dotted line represent the 95th percentile value for the identified month from the 2009–2011 data set. The 95th percentile is used to represent the upper limit of the normal historical fluctuations for each hour, based on EPA guidance for the 24-hour normal range between “average” and 95th percentile. Hourly values above this line indicate an “exceptional” hourly value that is beyond normal for that hour and month.

Middle Chart: Wind Speed and Wind Direction.

Wind Speed—The purple diamonds and solid line represent the wind speed in meters per second (m/s) recorded at the DEQ meteorological station in Pinehurst. The wind sensor is at 10 m agl.

Wind Direction, deg—The blue open squares represent the wind direction for the hour, at the DEQ meteorological station.

Bottom Chart: Solar Radiation and Temperature

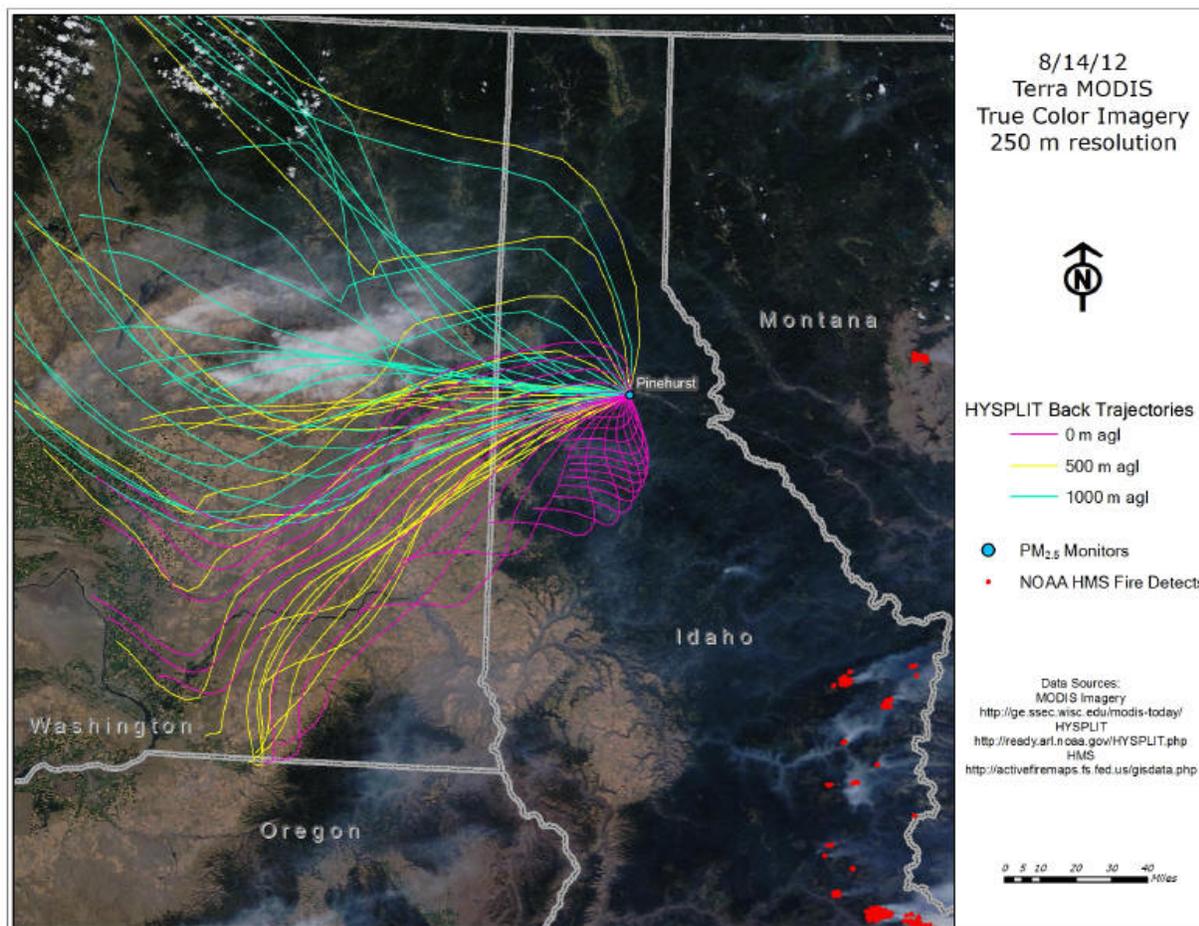
Temperature °F—The green triangles and green line represent the temperature at 2 m agl as measured at the DEQ meteorological station. It is included to indicate when the temperature dips below 40 °F, the point at which residential wood combustion is beginning to be used.

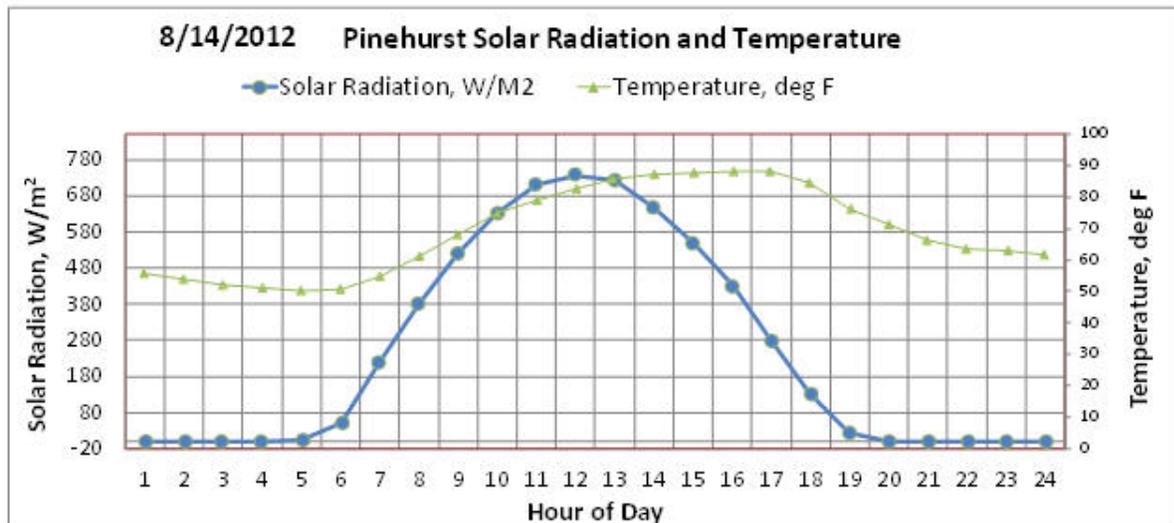
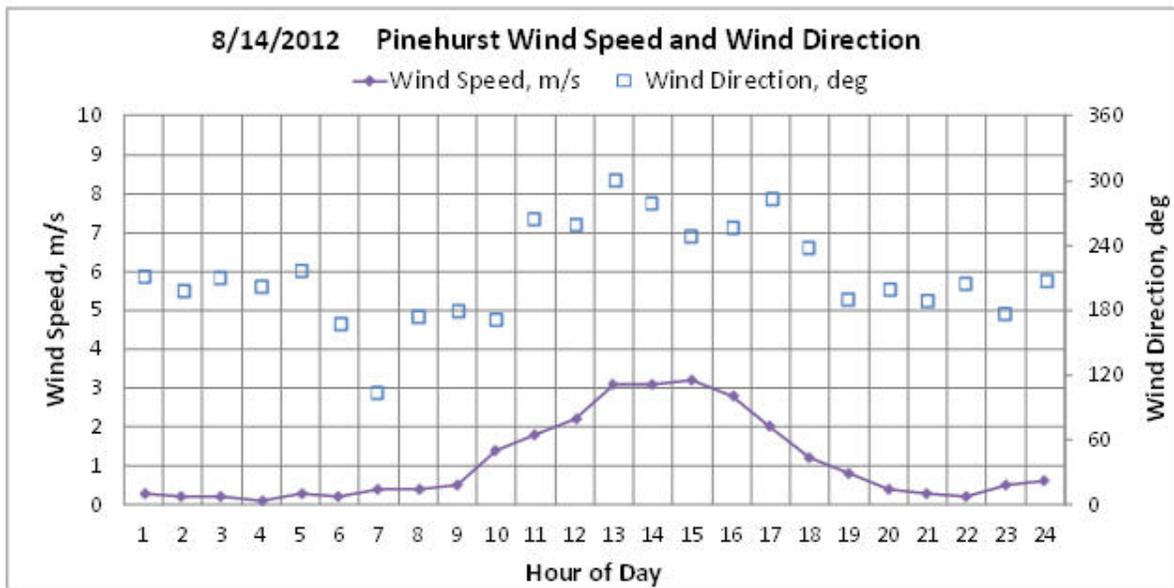
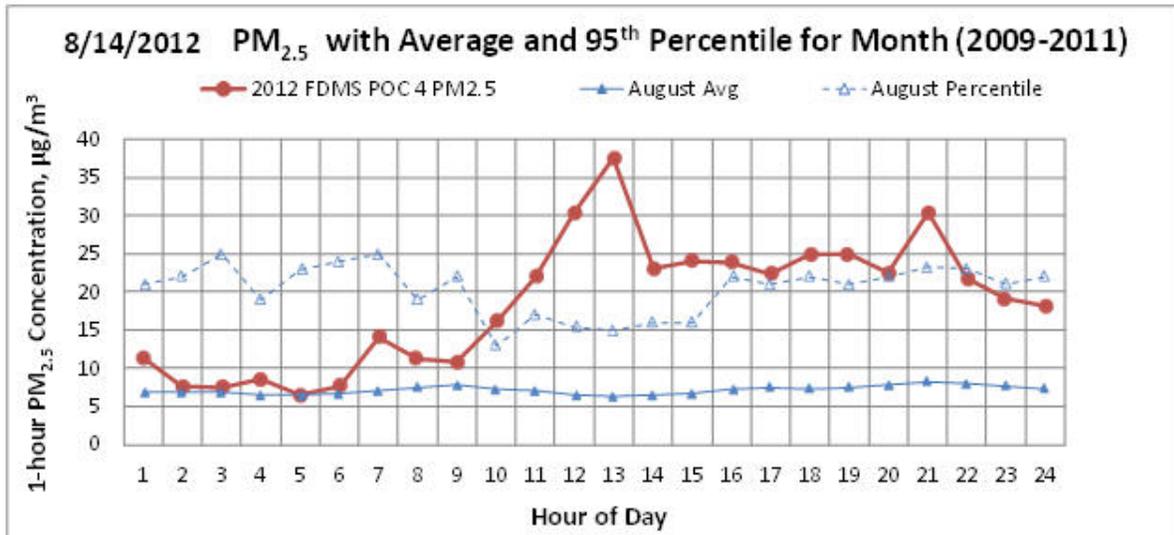
Solar Radiation, W/m²—The blue filled circles represent the solar radiation in Watts per square meter (W/m²) measured at the DEQ meteorological station. The solar intensity and cycle indicates when solar driven up-valley flows may be expected and when gravity driven down-slope and down-valley flows may be prevalent before sunrise and after sunset.

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August 14, 2012

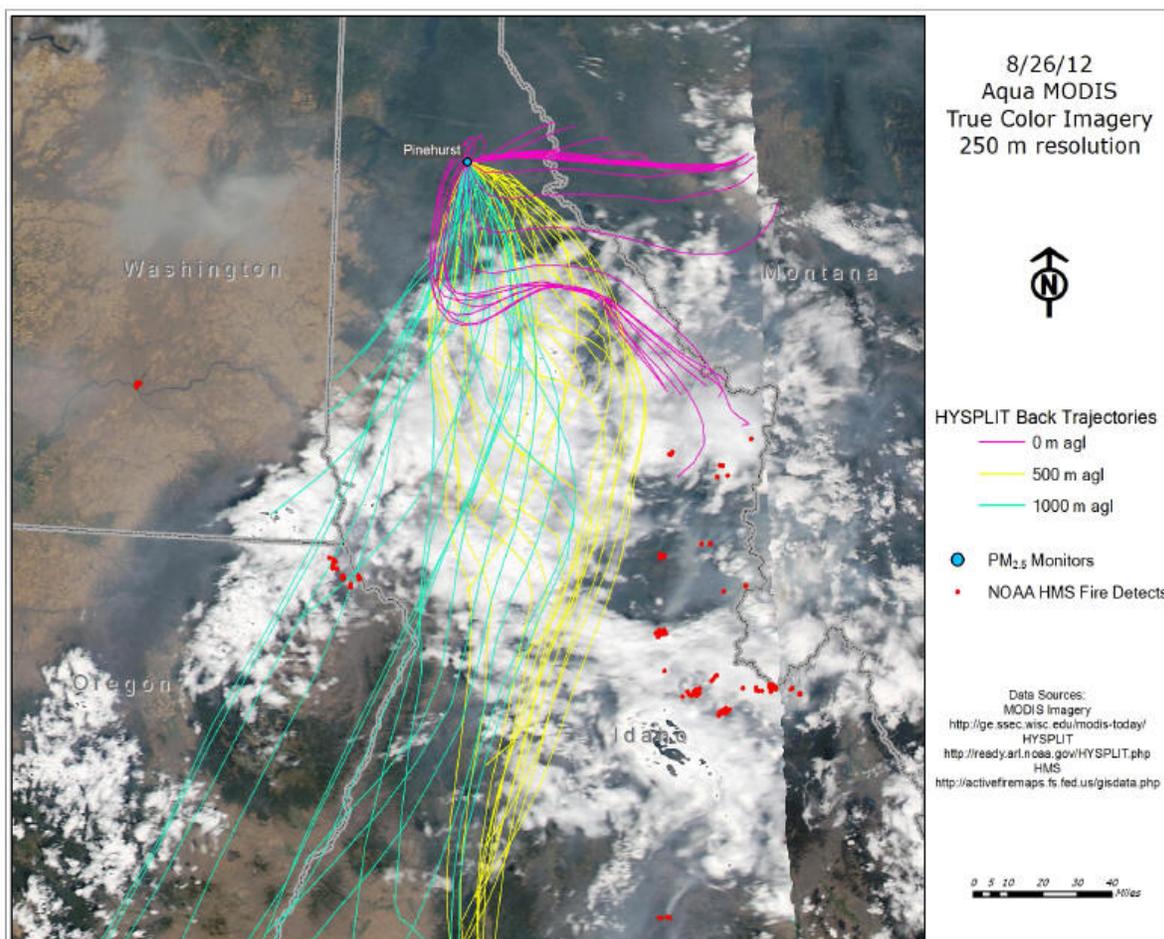
Summary of EER Evidence for Pinehurst Monitor Value, 18.6 $\mu\text{g}/\text{m}^3$ on 8-14-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; >79 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1 (See Sec. 4) Regional Transport
	Weather Conditions:	Flat ridge aloft provides zonal flow into the northern Panhandle which advects smoke from WA into the Silver Valley.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows smoke in eastern Washington. Back trajectories intersect smoke and/or fire detects from the Taylor Bridge (WA) fire. Hourly trace shows rising concentrations beginning at 10 am and remaining above 20 $\mu\text{g}/\text{m}^3$ and above the August 95 th percentile hourly values until 10 pm.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. No CRB in Kootenai, Shoshone or Benewah Co. See Sec. 4.10.5 and 4.11.5.
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Oct. (p.23)
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), so this event contributed 3.6 to 11.6 $\mu\text{g}/\text{m}^3$ above normal fluctuations. Thus there would not have been concentrations above this range "but for" this exceptional event.
Mitigation:	See Sec 8 and Appendix E	DEQ issued news releases July 12 and Aug. 9 on reducing wildfire smoke exposure

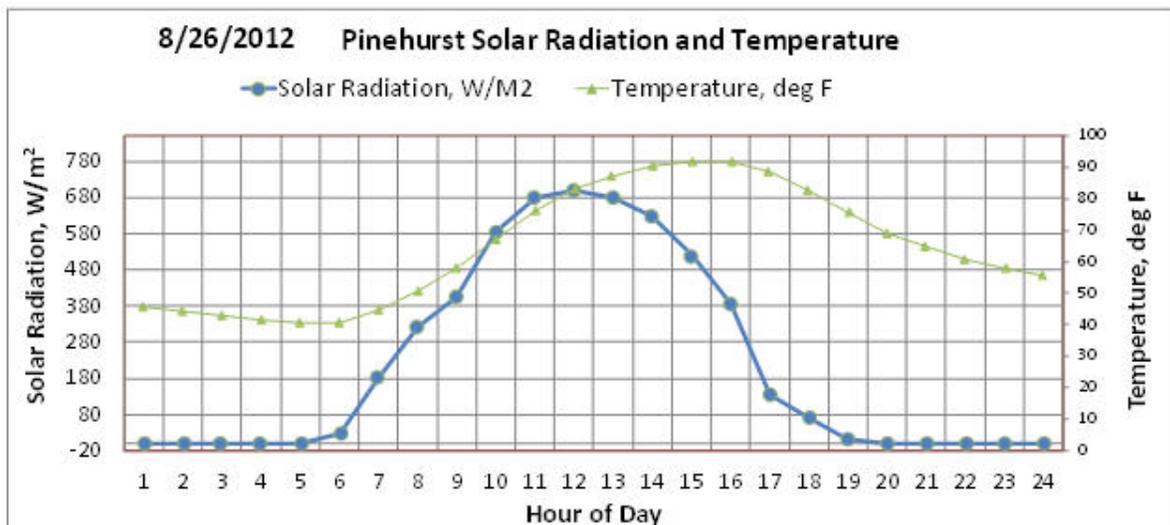
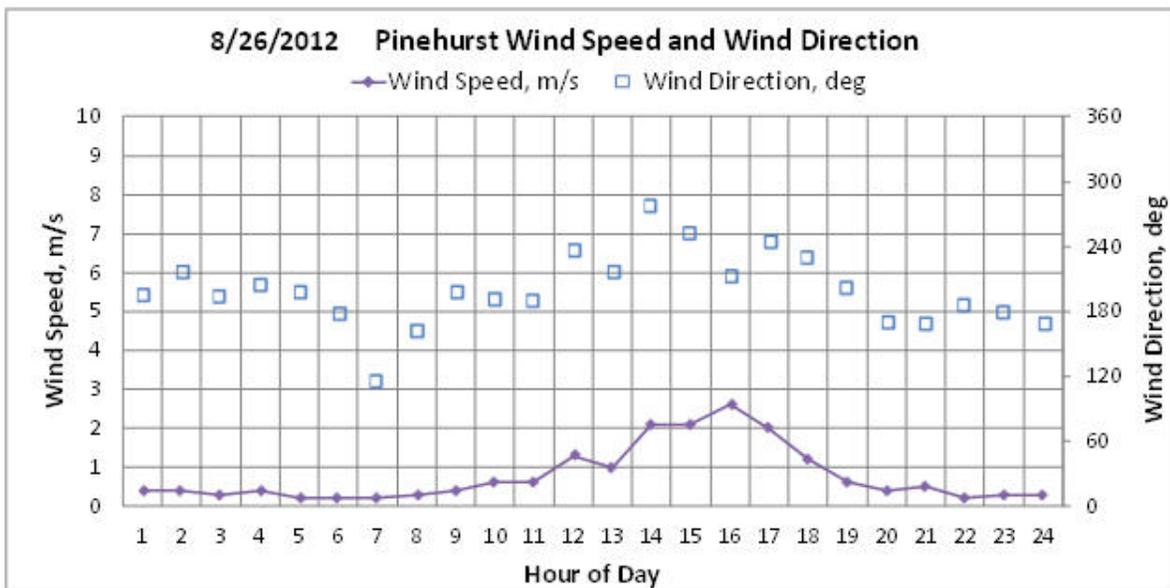
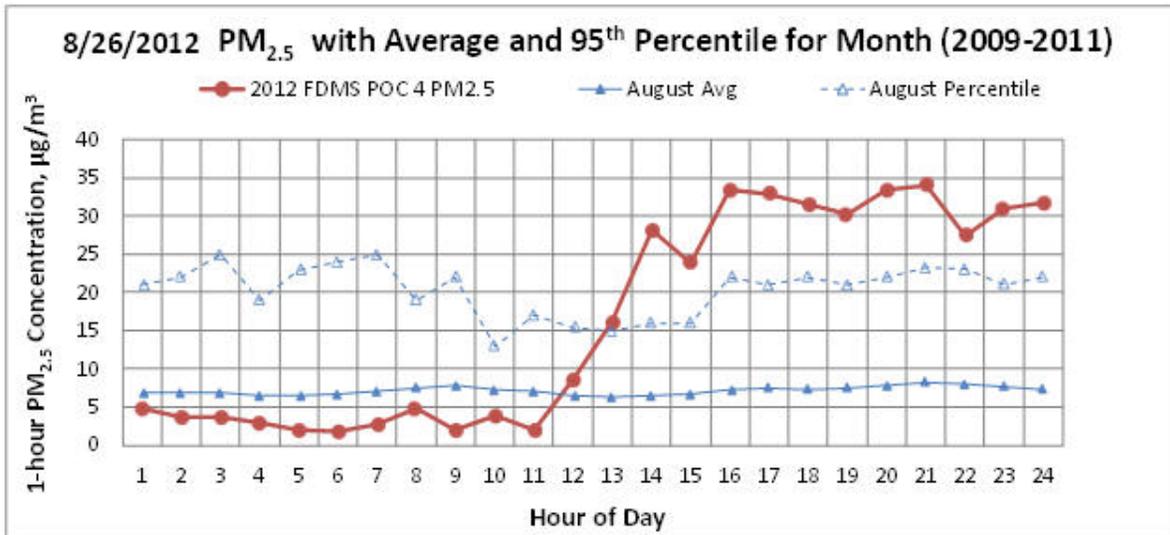




August 26, 2012

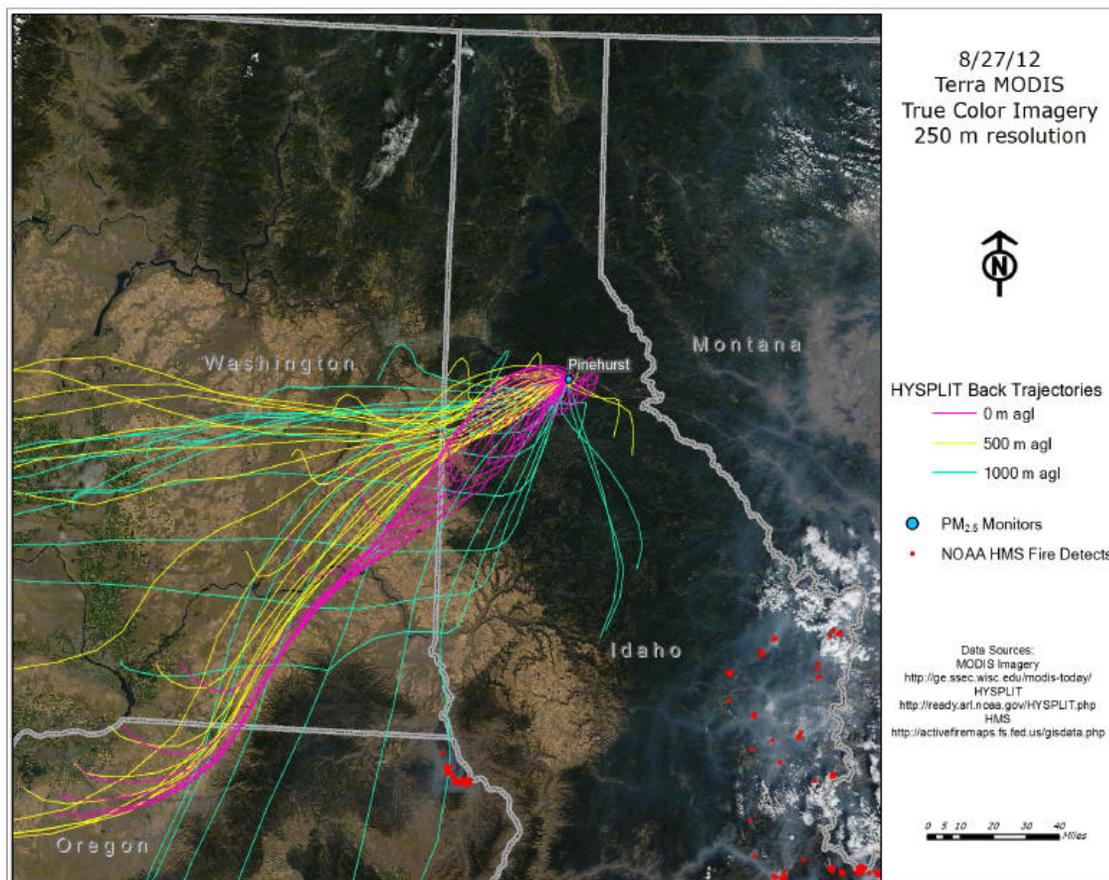
Summary of EER Evidence for Pinehurst Monitor Value, $16.5 \mu\text{g}/\text{m}^3$ on 8-26-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>97 th percentile seasonally; >75 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2 (See Sec. 4)
	Weather Conditions:	Ridge axis centered along the MT/ID border provides south/southwest flow to advect smoke into the northern Panhandle.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image clearly shows light smoke across the region and clouds to the south of Pinehurst. Back trajectories intersect smoke and/or fire detects from the Powell SBW, Trinity Ridge (ID), Cache Creek (OR), Chips, and Bagley (CA) fires. Hourly trace shows values beginning to rise at noon and hovering around $30 \mu\text{g}/\text{m}^3$ for the remainder of the day, well above the hourly 95 th percentile levels for August.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. No CRB in Kootenai, Shoshone or Benewah Co. See Sec. 4.10.5 and 4.11.5.
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Oct(p.23)
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/ HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to $15 \mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 1.5 to $9.5 \mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	DEQ issued news releases July 12 and Aug. 9 on reducing wildfire smoke exposure

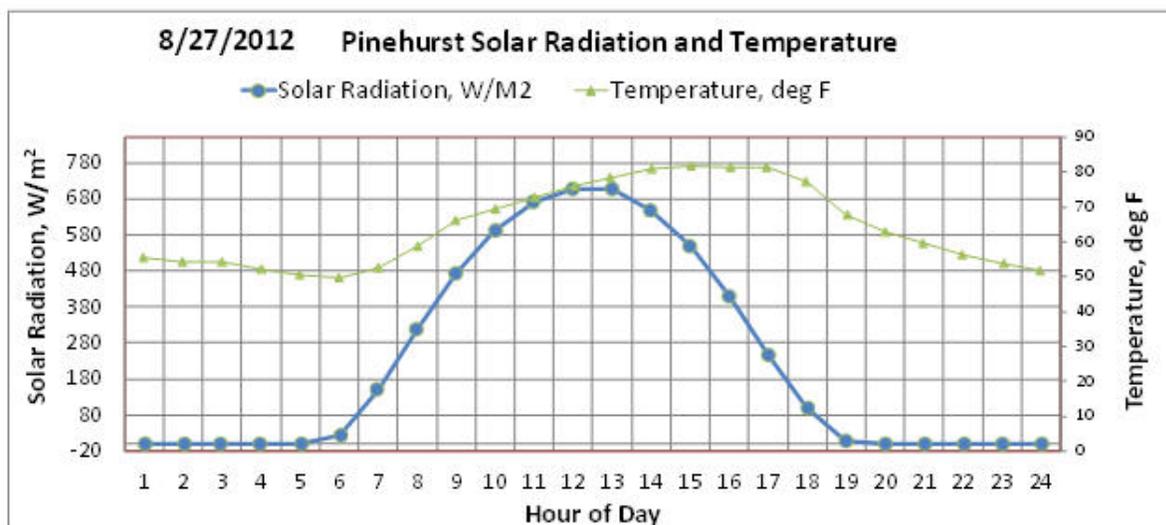
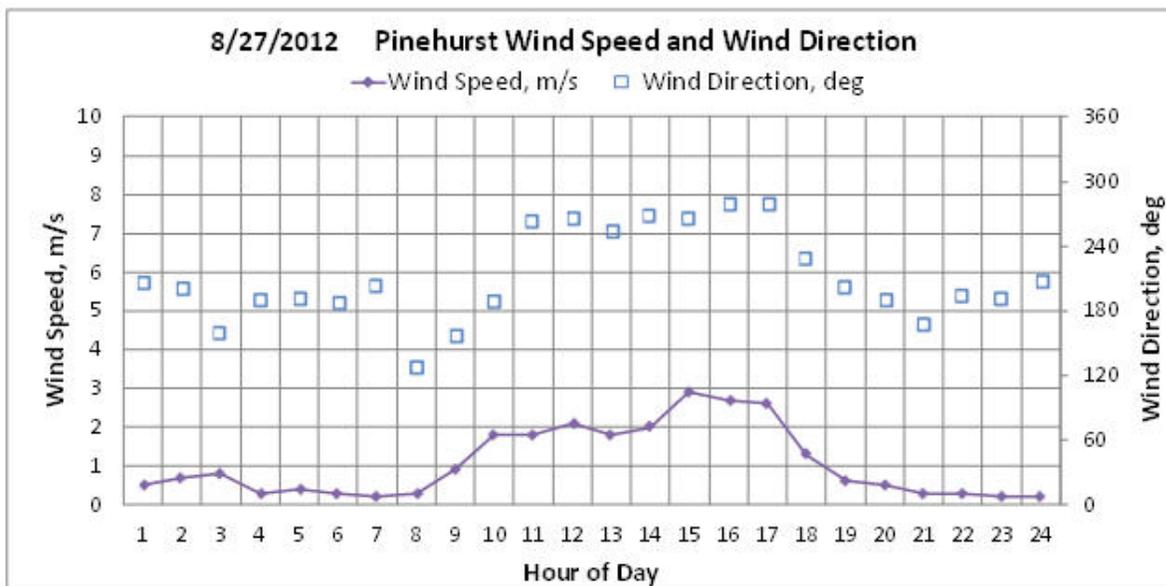
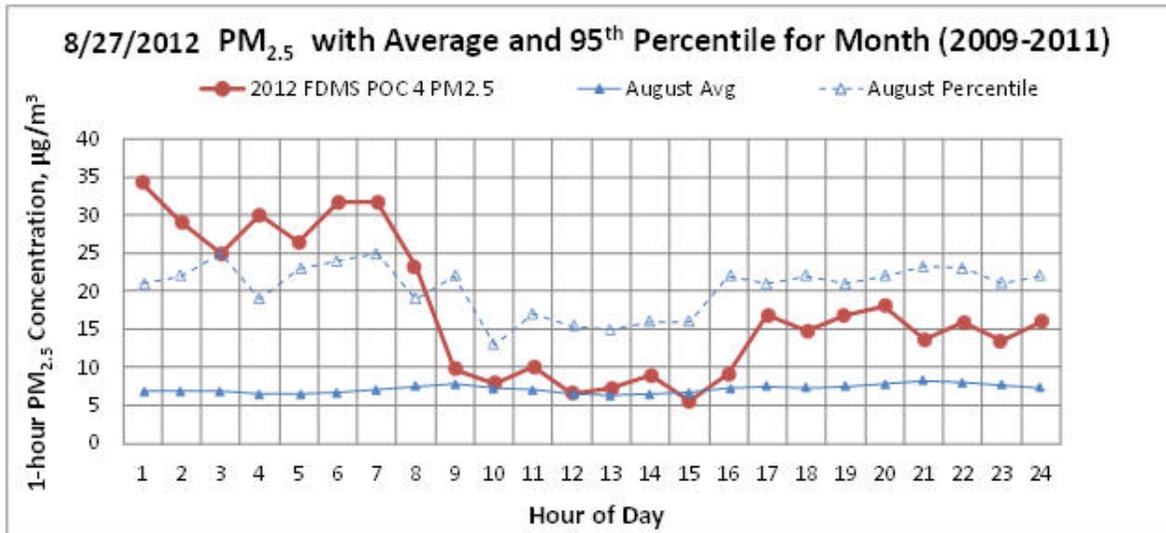




August 27, 2012

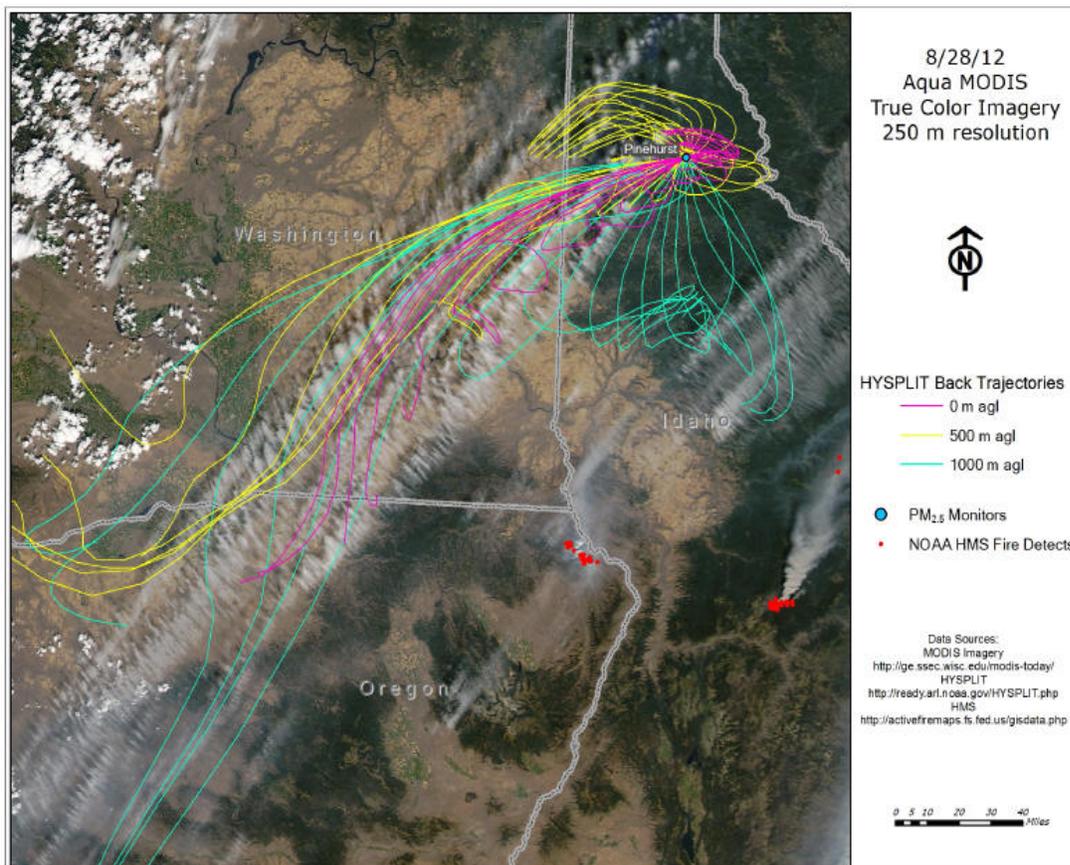
Summary of EER Evidence for Pinehurst Monitor Value, 17.6 $\mu\text{g}/\text{m}^3$ on 8-27-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>98 th percentile seasonally; >76 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 2 (See Sec. 4)
	Weather Conditions:	Ridge axis continues to shift to the east, providing a more westerly component to the transport winds. Incoming cold front provided midday clearing of the Silver Valley.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Hourly trace shows high concentrations early in the morning. Leftover smoke from the previous day (over 30 $\mu\text{g}/\text{m}^3$ at midnight (see 8/26 chart and smoke in 8/26 Aqua MODIS image.) This smoke remained trapped in the valley above 95 th % levels until the inversion broke and winds increased enough to remove the smoke 8 – 9am). Morning satellite image (~10:45am) shows clear skies near Pinehurst. Back trajectories intersect smoke and/or fire detects from the Cache Creek (OR), Chips, and Bagley (CA) fires.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. No CRB in Kootenai, Shoshone or Benewah Co. See Sec. 4.10.5 and 4.11.5.
	Speciation:	IMPROVE data show carbon PM _{2.5} was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95 th tile), thus, this event contributed 2.6 to 10.6 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	DEQ issued news releases July 12 and Aug. 9 on reducing wildfire smoke exposure

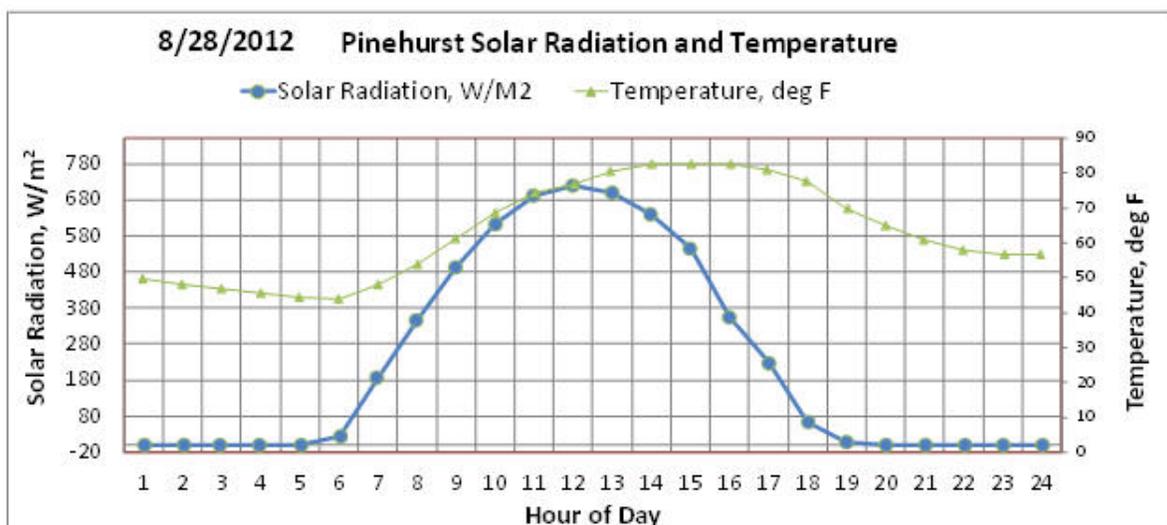
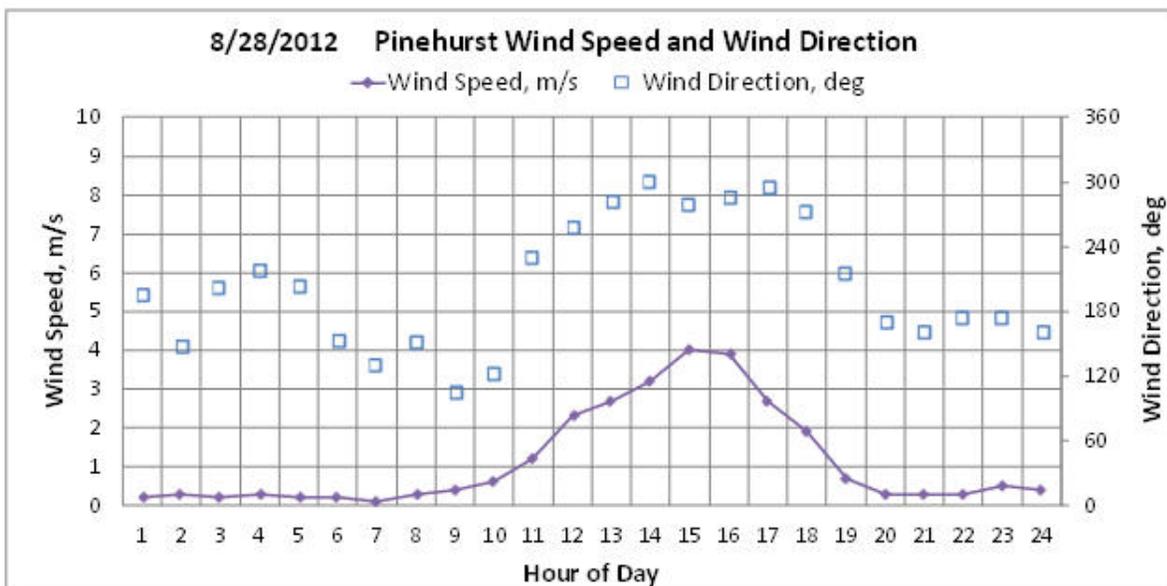
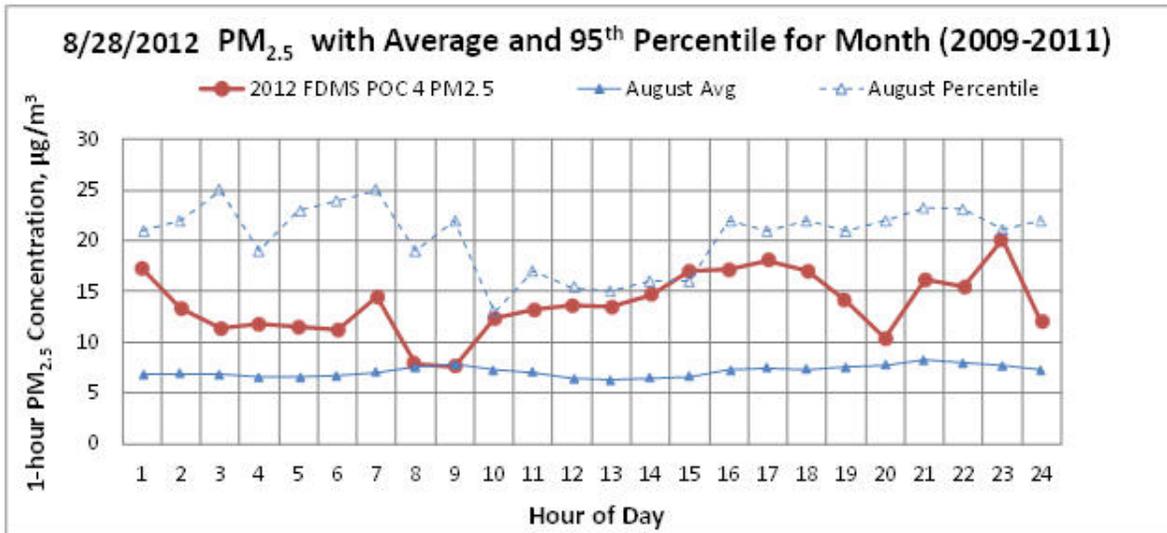




August 28, 2012

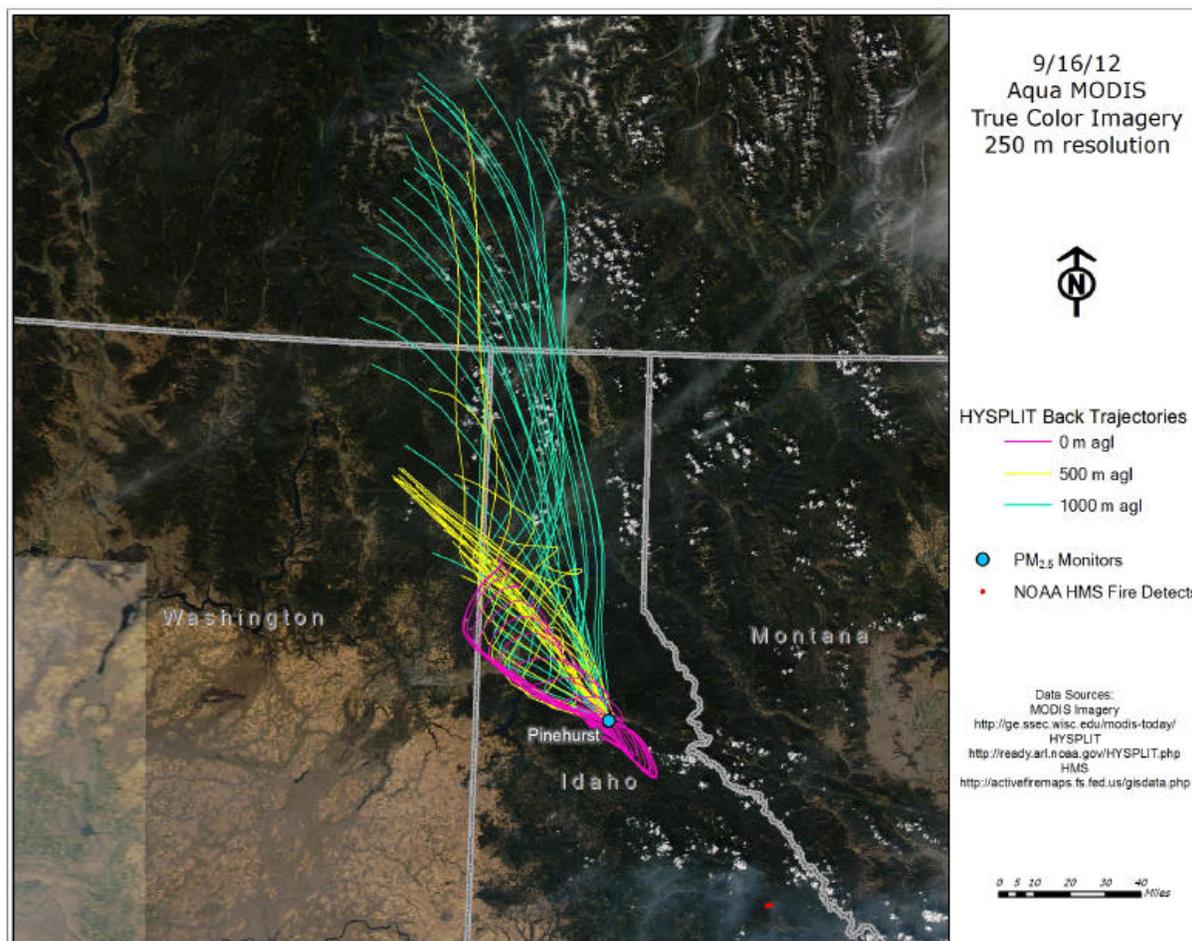
Summary of EER Evidence for Pinehurst Monitor Value, 13.8 $\mu\text{g}/\text{m}^3$ on 8-28-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>93 rd percentile seasonally; >68 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1 (See Sec. 4)
	Weather Conditions:	Previous cold front has become a stationary front while ridge axis centered over the Dakotas continues to provide SW transport into northern Idaho.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows light smoke mixed with high cirrus streaks associated with upper level jet streak tracking across Oregon and eastern Washington. Back trajectories intersect smoke and/or fire detects from the Chips and Bagley (CA) fires. Hourly trace shows sustained concentrations between 10 and 20 $\mu\text{g}/\text{m}^3$ well above average for most of the day with 4 hours at or near the 95 th percentile values for August.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. No CRB in Kootenai, Shoshone or Benewah Co. See Sec. 4.10.5 and 4.11.5. Evening temp >45F so RWC contribution is likely minimal except early morning when $\text{PM}_{2.5}$ is lowest.
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/ HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed from zero up to 6.8 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	DEQ issued news releases July 12 and Aug. 9 on reducing wildfire smoke exposure

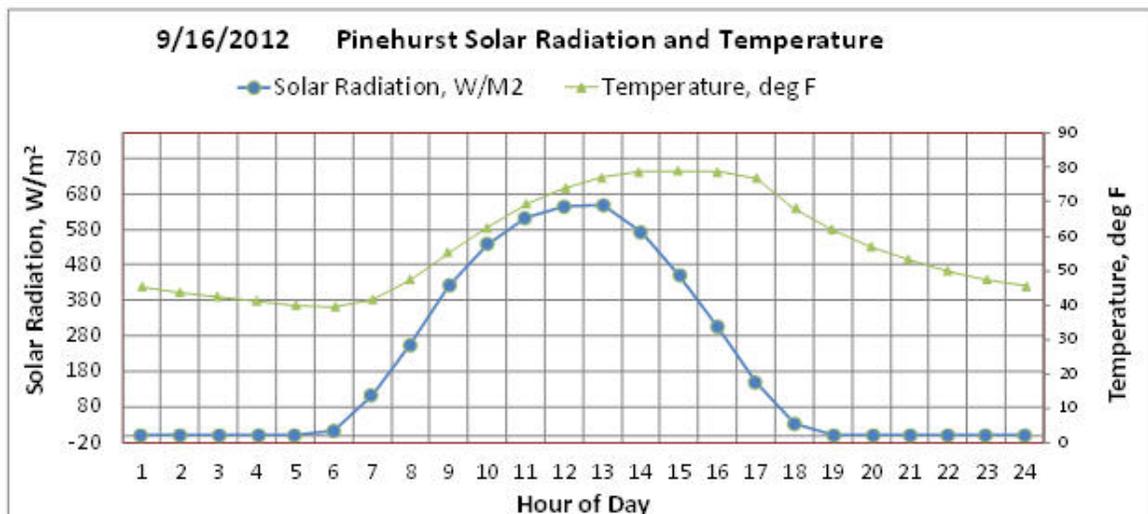
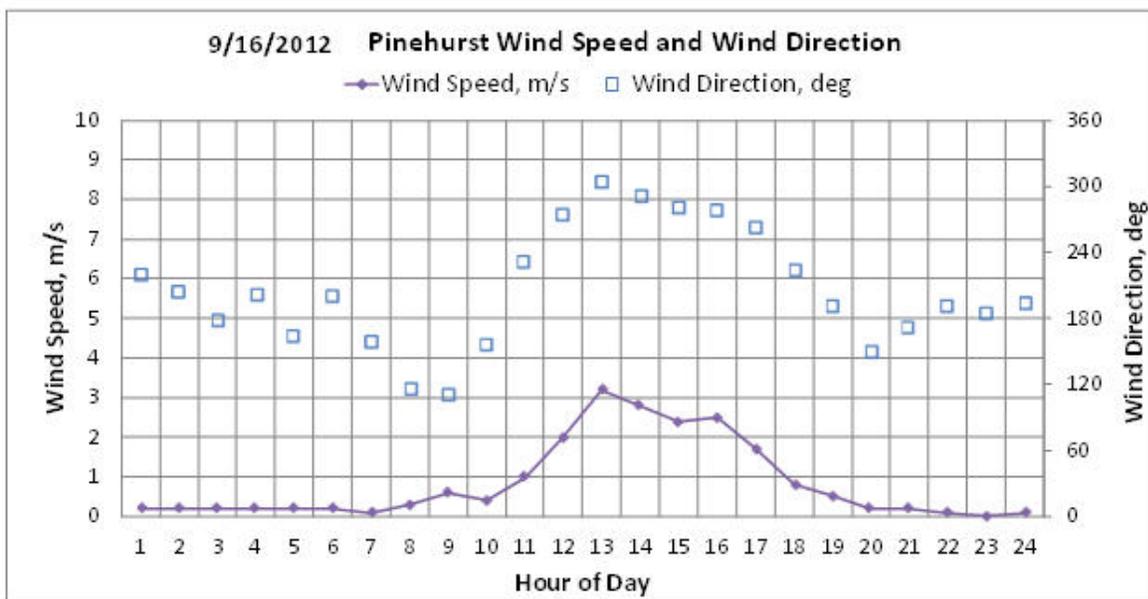
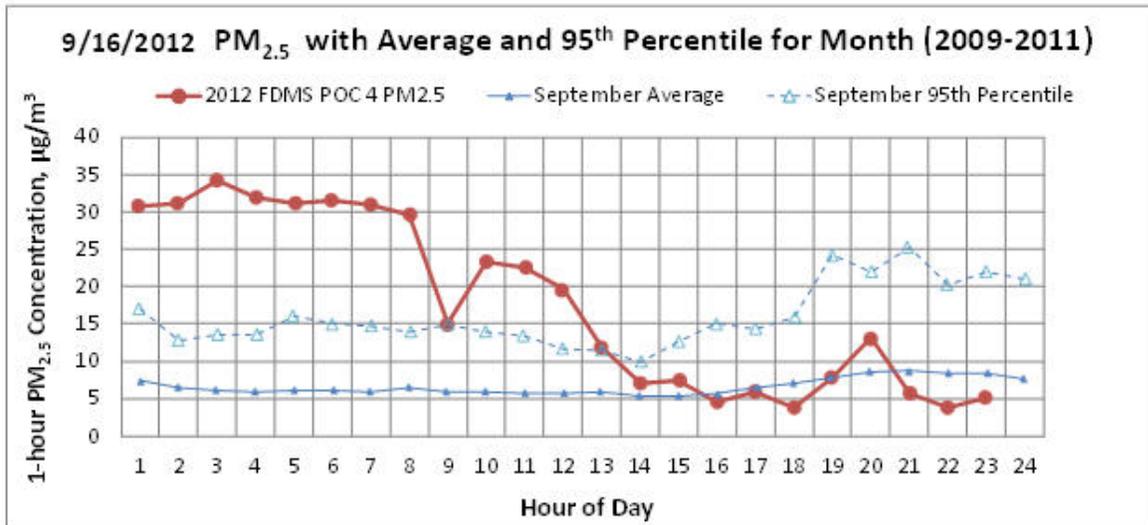




September 16, 2012

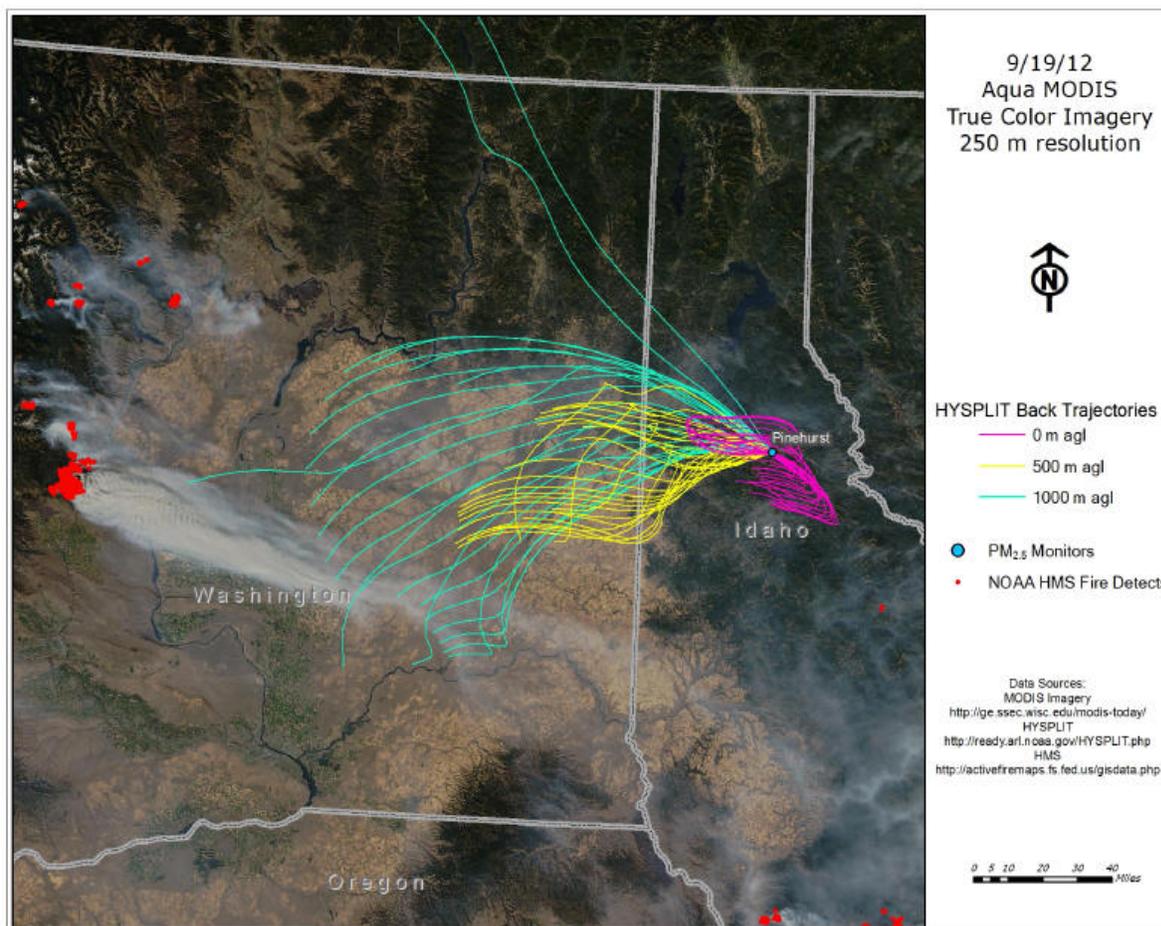
Summary of EER Evidence for Pinehurst Monitor Value, $17.7 \mu\text{g}/\text{m}^3$ on 9-16-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>98 th percentile seasonally; >76 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 2 Stagnation, trapping $\text{PM}_{2.5}$ from previous day (See Sec. 4)
	Weather Conditions:	Shortwave retrogrades, forcing northerly flow from highly amplified ridge centered over Haida Gwaii BC. Quasi-stationary front provides clearing in the Silver Valley.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows a small patch of smoke in the Idaho Panhandle. Back trajectories intersect this smoke and no fire detects. Hourly trace shows high morning concentrations with clearing in the afternoon. Hourly trace for previous day shows ~ $35 \mu\text{g}/\text{m}^3$ $\text{PM}_{2.5}$ which remained trapped overnight and above the 95 th percentile levels until 1300 LST when the inversion breaks and the wind increases.
	Alternative Hypotheses:	Stage 1 Forecast/Caution in effect. Prohibits open burning of any kind. See Sec. 4
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/ HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to $15 \mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 2.7 to $10.7 \mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	Notification of Stage 1 Forecast/Caution advised residents of protective actions.

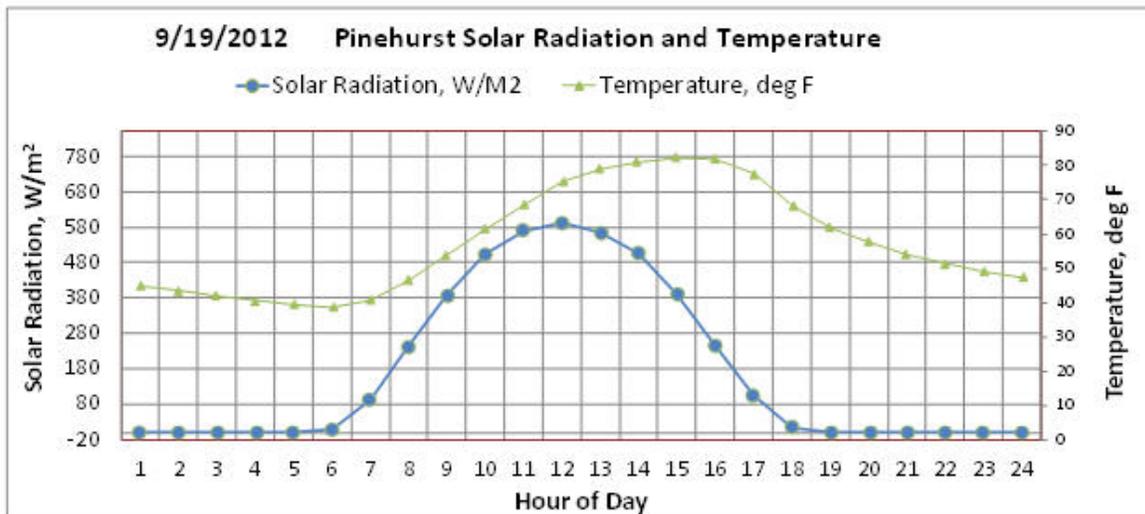
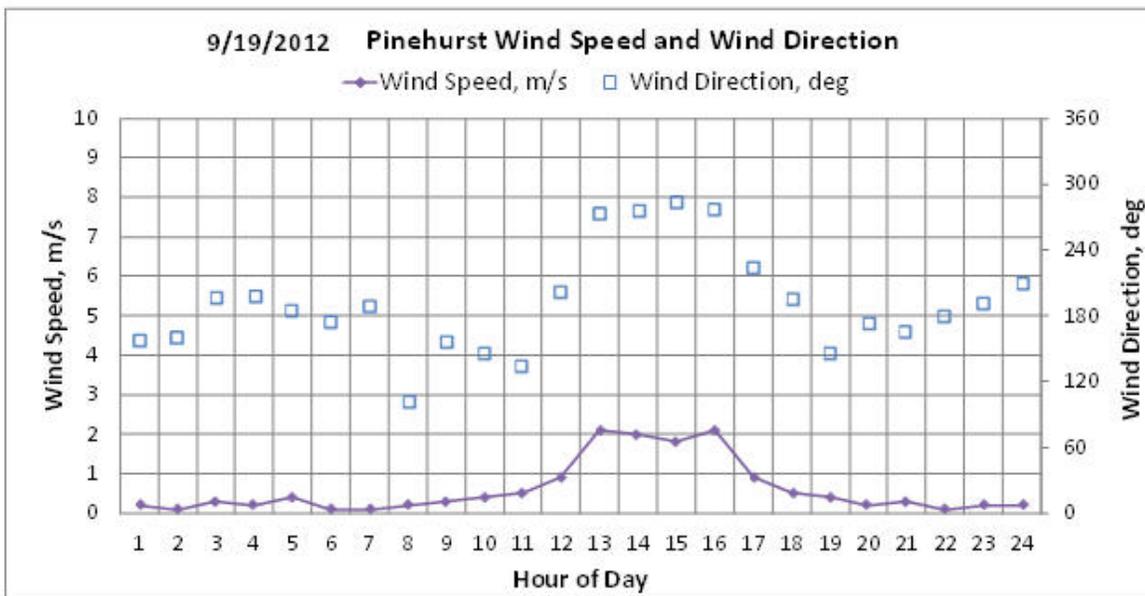
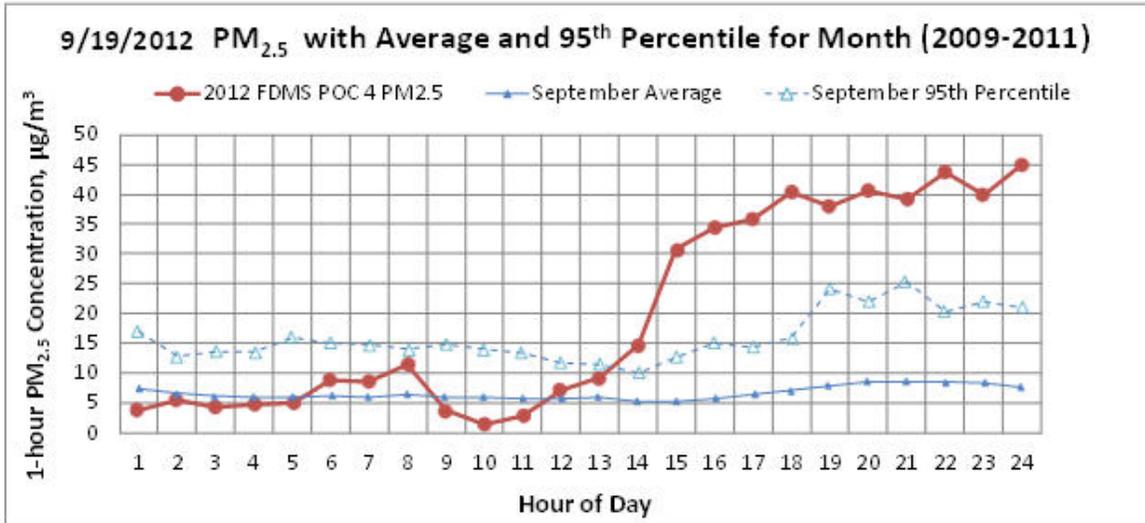




September 19, 2012

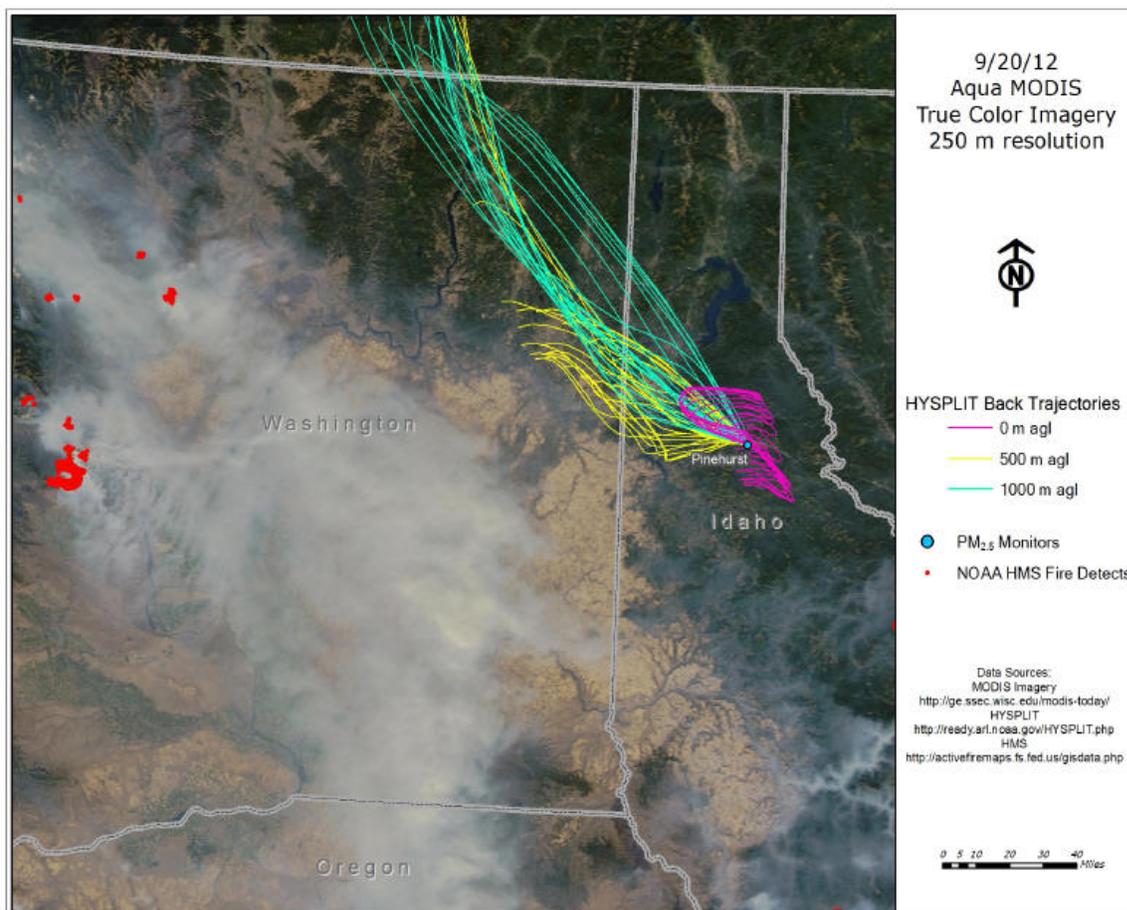
Summary of EER Evidence for Pinehurst Monitor Value, 19.9 $\mu\text{g}/\text{m}^3$ on 9-19-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; >81 st percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2 (See Sec. 4)
	Weather Conditions:	Weak upper level pressure gradients provide light winds from the west-northwest as offshore rex block develops and diurnal mountain-valley flow dominates.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows a massive plume blowing southeast from the Wenatchee Complex and light smoke covering Pinehurst and surrounding areas. Back trajectories intersect smoke and/or fire detects from the Wenatchee Complex (WA). Hourly trace shows concentrations rising in the afternoon and staying high. Smoke rolls in from west ~ 1400 and is trapped by stable air/light winds overnight.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. Stage 1 Forecast/Caution in effect, prohibiting open burning of any kind. See Sec. 4
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 4.9 to 12.9 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	Notification of Stage 1 Forecast/Caution advised residents of protective actions.

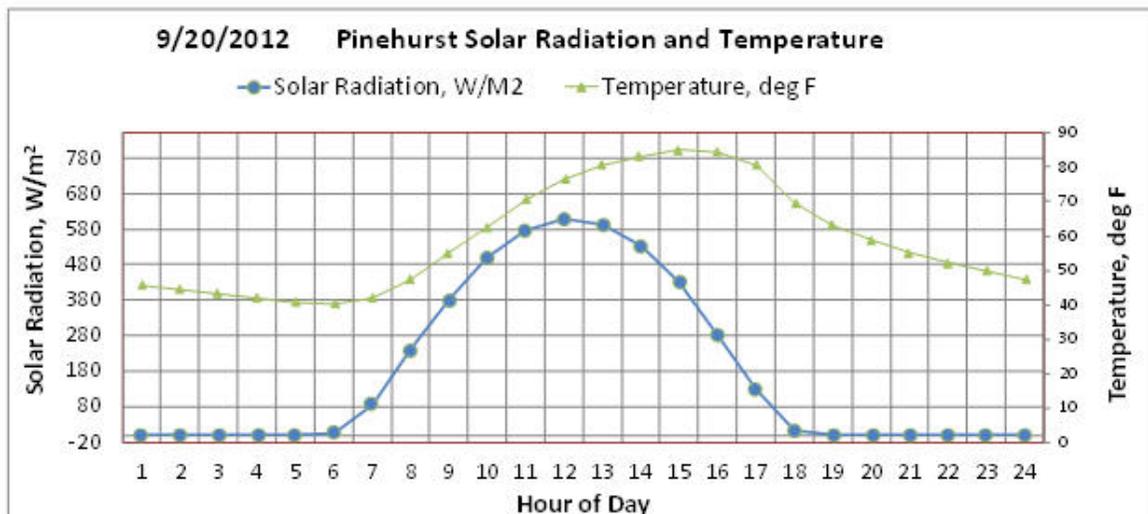
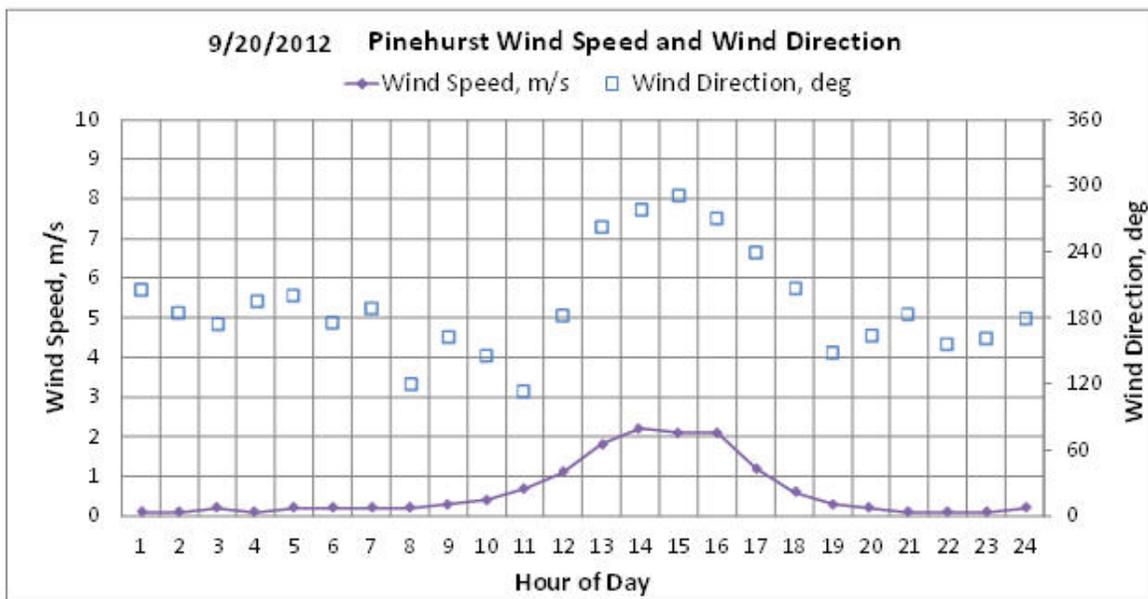
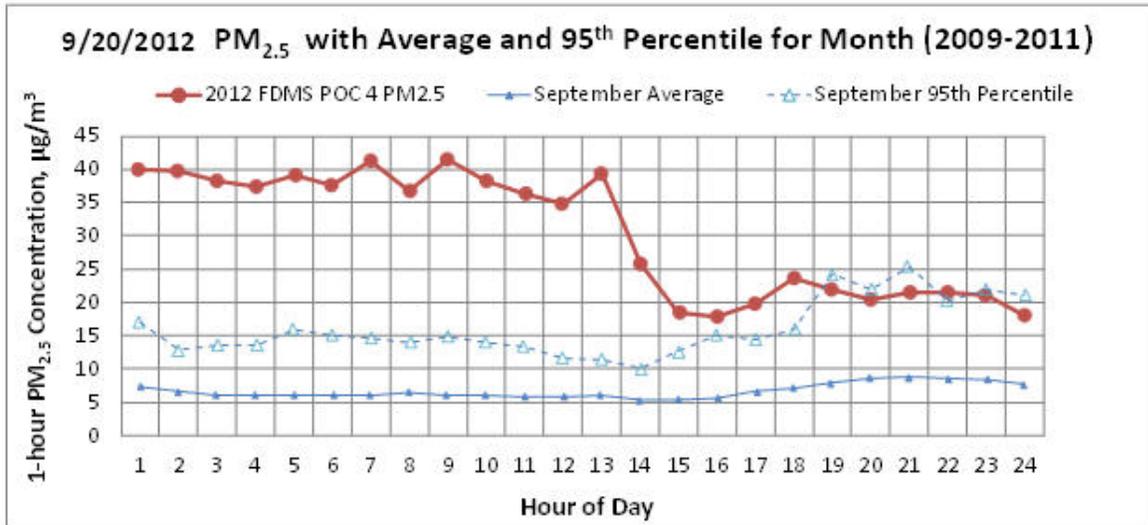




September 20, 2012

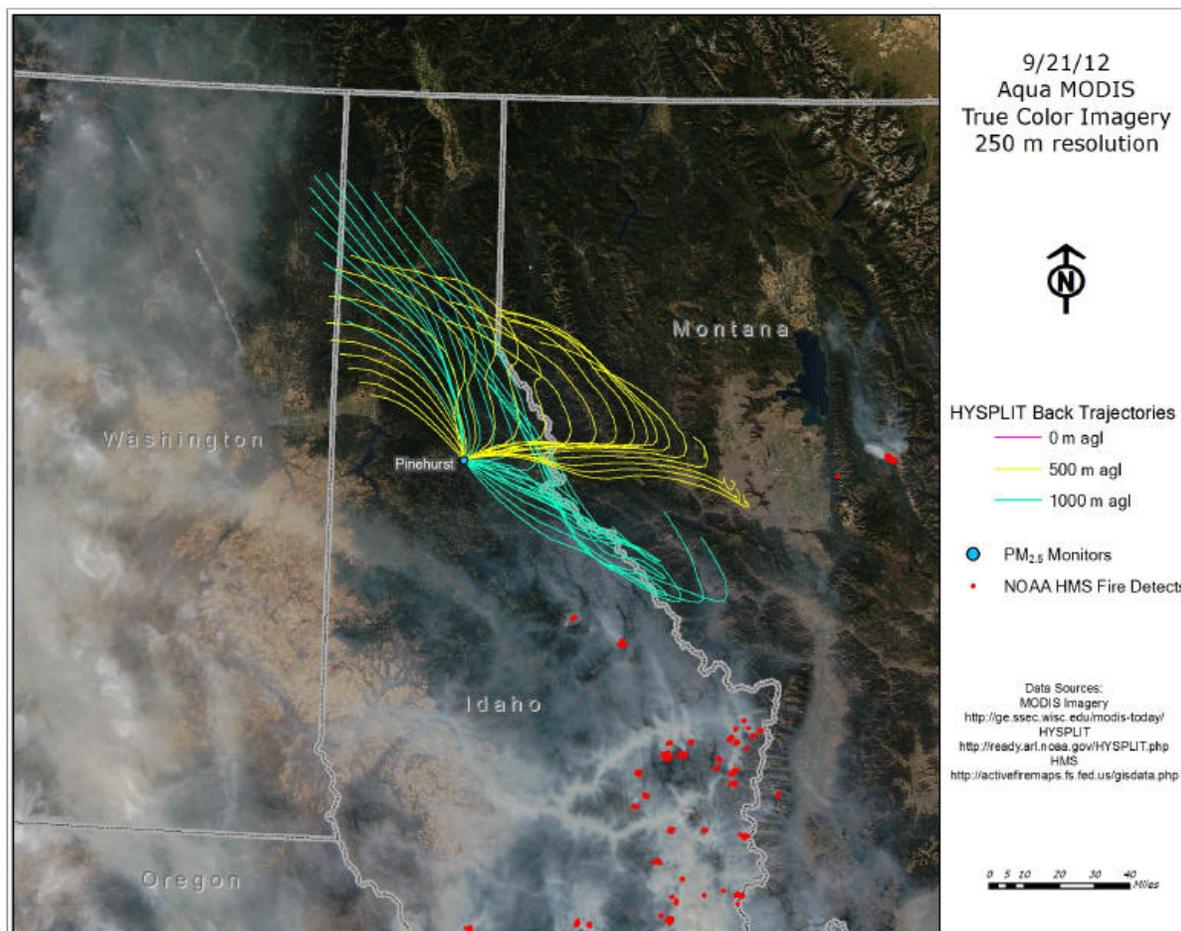
Summary of EER Evidence for Pinehurst Monitor Value, 30.4 $\mu\text{g}/\text{m}^3$ on 9-20-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; >94 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 2 (See Sec. 4) with regional transport possible in afternoon (Scenario 1)
	Weather Conditions:	Highly amplified ridge extends from NV to AK through eastern WA. This provides very light winds through the atmosphere and generally from the northwest.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Hourly trace shows high concentrations in the morning trapped from 9/19 evening (>40 $\mu\text{g}/\text{m}^3$), clearing in the afternoon, a classic stagnation signature. Afternoon satellite image shows dense smoke in eastern WA from the Wenatchee Complex and light smoke covering Pinehurst and surrounding areas. Back trajectories may intersect smoke and/or fire detects from the Wenatchee Complex (WA). Surface trajectories recirculate local air.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. Stage 1 Forecast/Caution in effect, prohibiting open burning of any kind. See Sec. 4
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/ HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 15.4 to 23.4 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	Notification of Stage 1 Forecast/Caution advised residents of protective actions.

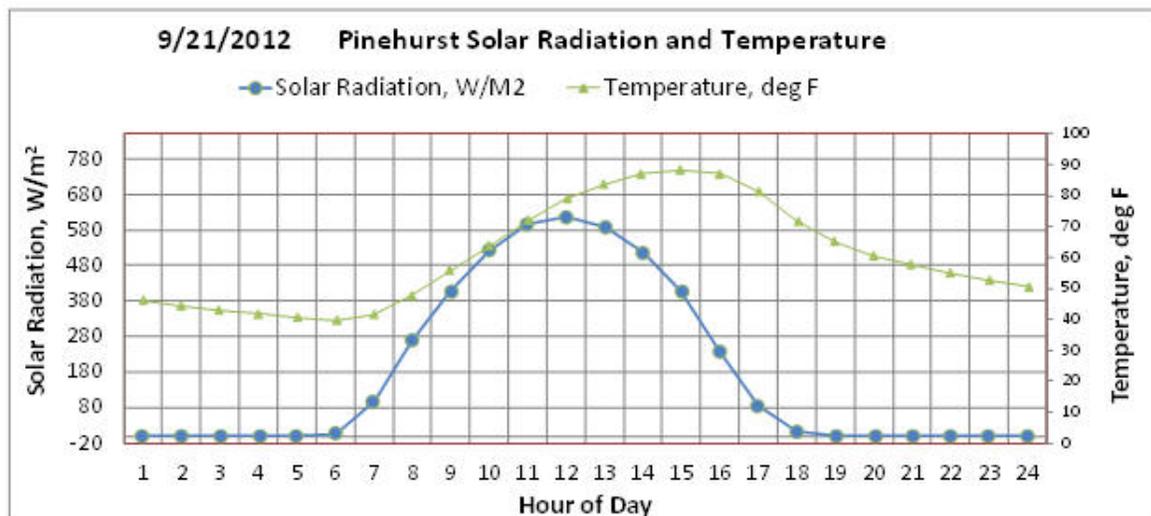
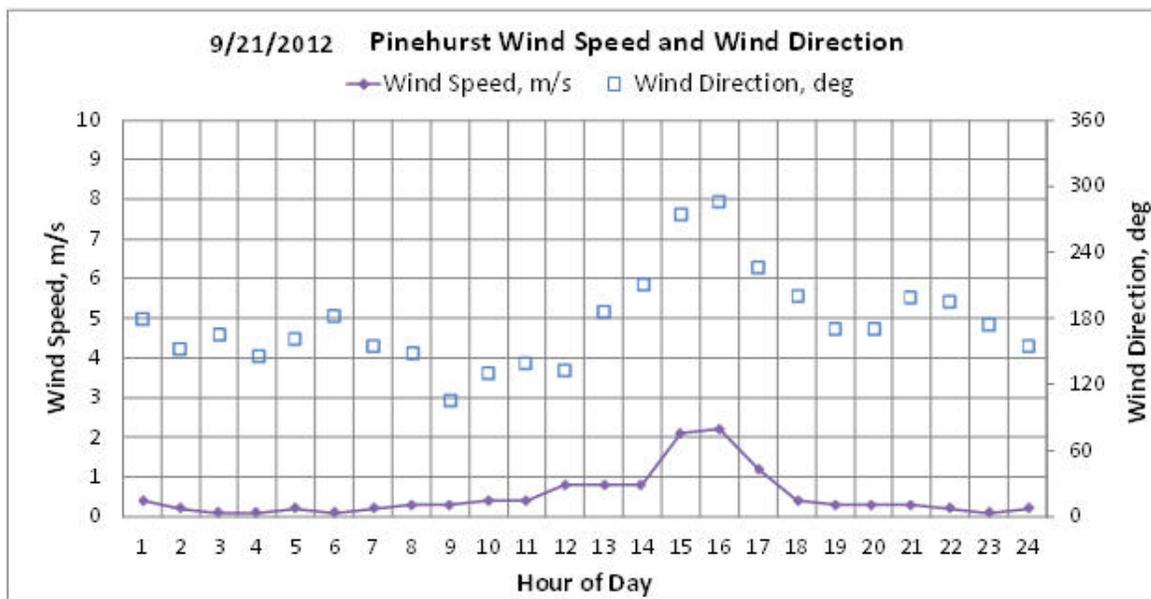
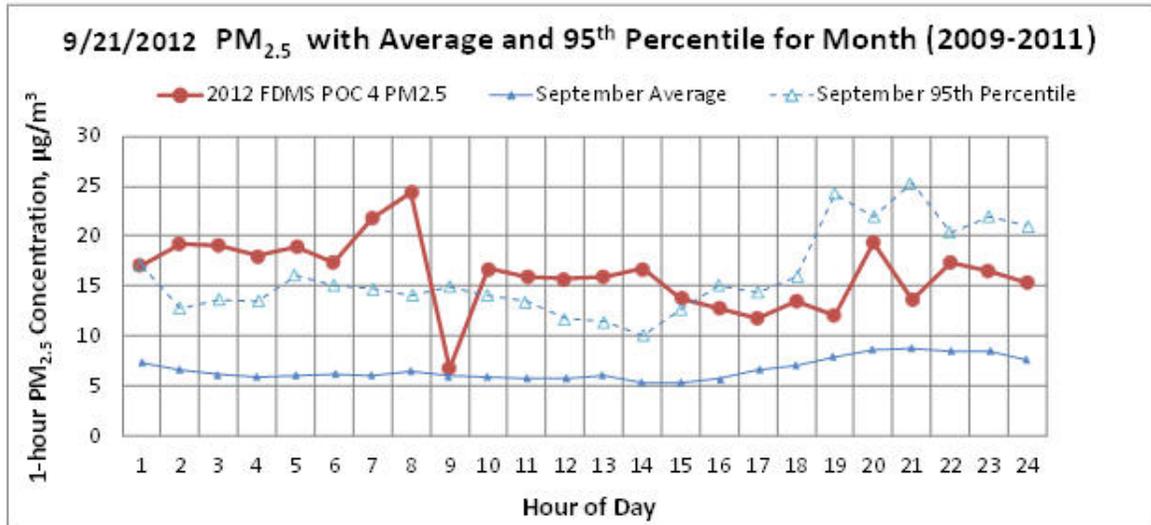




September 21, 2012

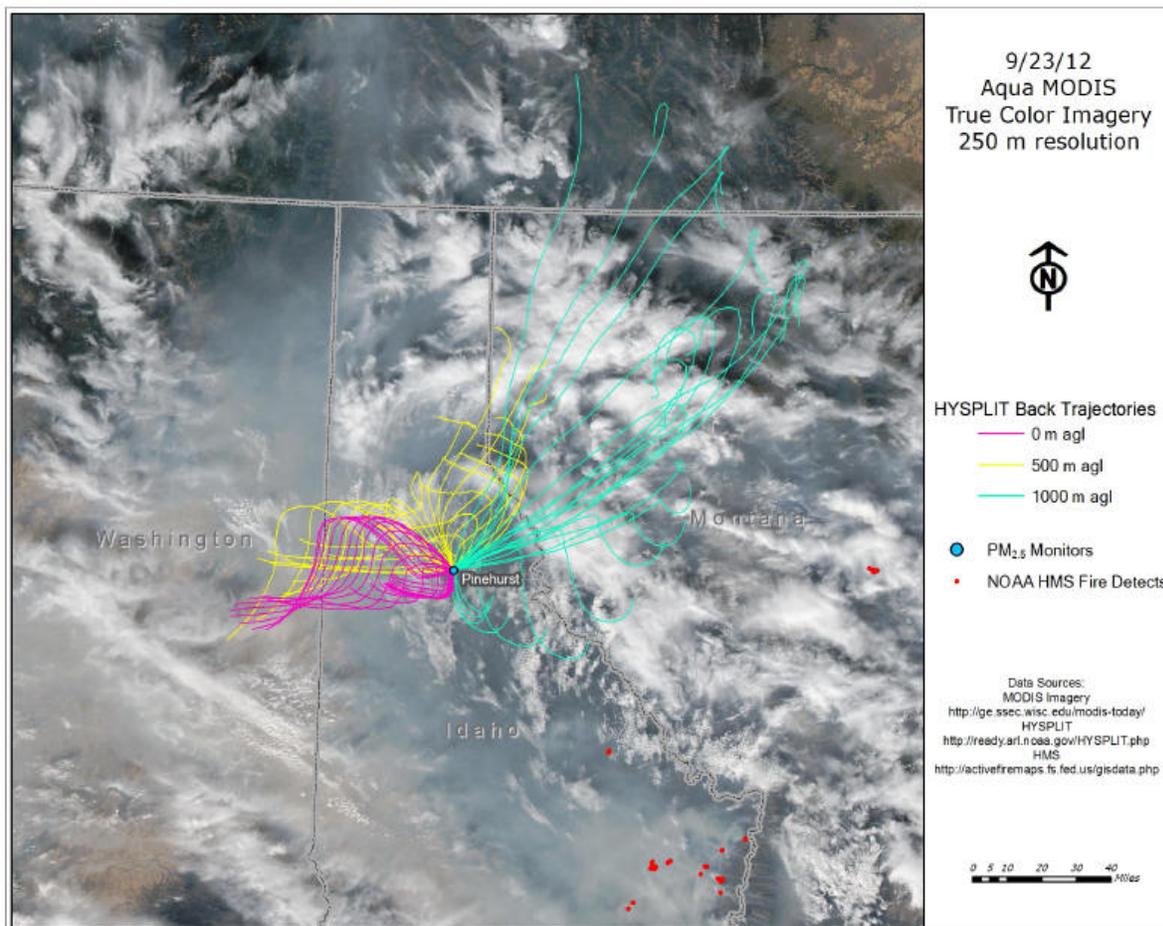
Summary of EER Evidence for Pinehurst Monitor Value, $16.2 \mu\text{g}/\text{m}^3$ on 9-21-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>97 th percentile seasonally; >74 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1 (See Sec. 4) with some stagnation trapping 9/20 pollutants (Scenario 2)
	Weather Conditions:	Ridge axis shifts directly over Idaho with upper level pressure gradients at a magnitude of 0.6mb/100mi. Local terrain-driven winds are primary drivers.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows dense smoke in eastern WA and to the south of Pinehurst. Plumes from the northernmost fire detects in ID and MT blow north. Back trajectories intersect smoke and/or fire detects from the Powell SBW Complex. Hourly trace starts high from elevated levels on 9/20 and remains steady around $15\text{-}20 \mu\text{g}/\text{m}^3$ and above the 95 th percentile hourly values for a majority of the day.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. Stage 1 Forecast/Caution in effect, prohibiting open burning of any kind. See Sec. 4
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/ HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to $15 \mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 1.2 to $9.2 \mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	Notification of Stage 1 Forecast/Caution advised residents of protective actions..

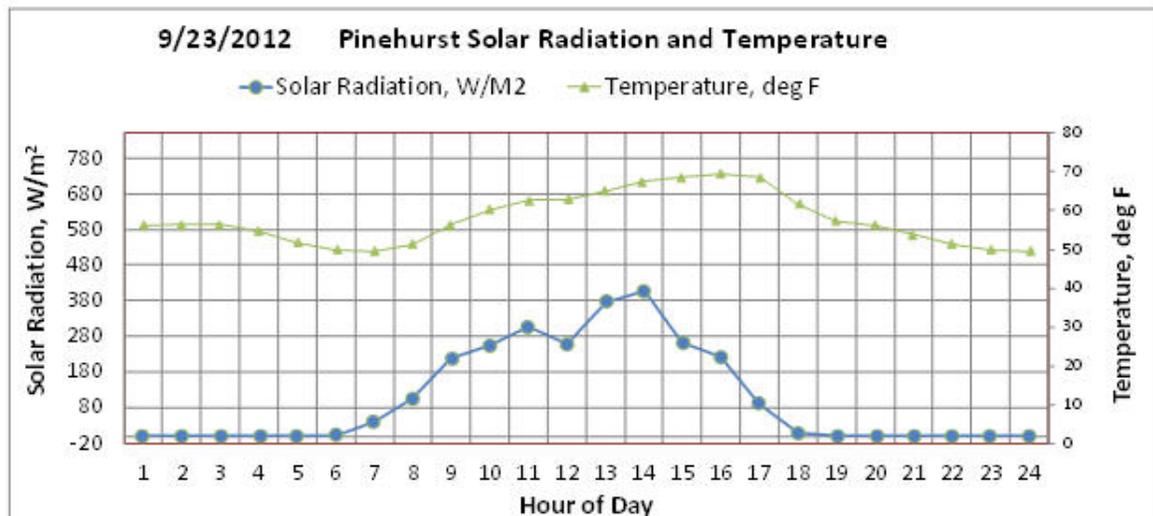
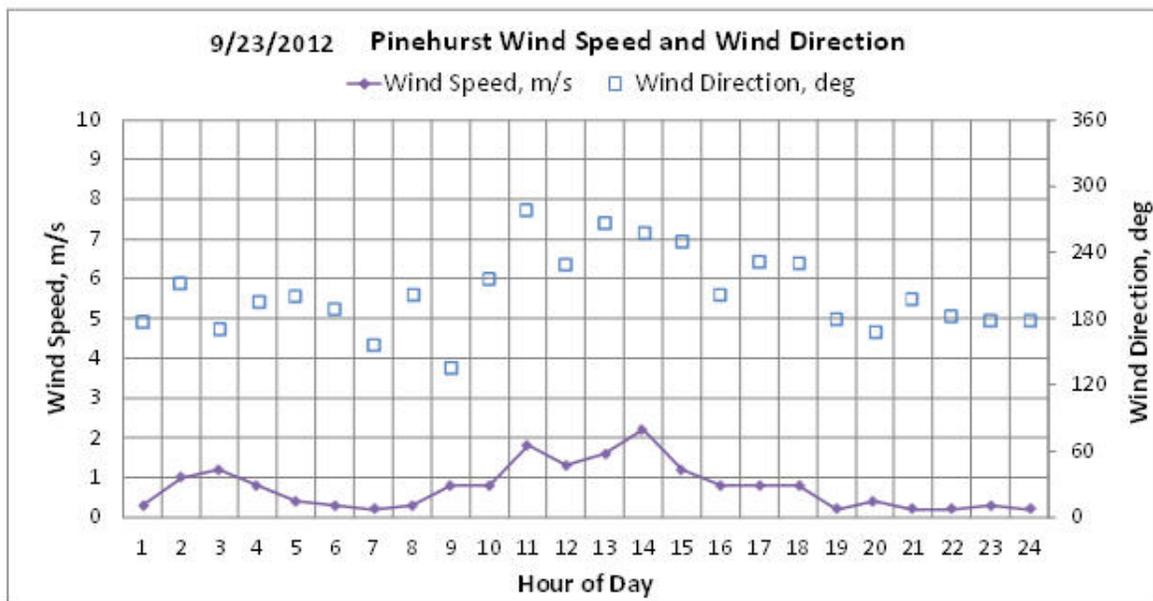
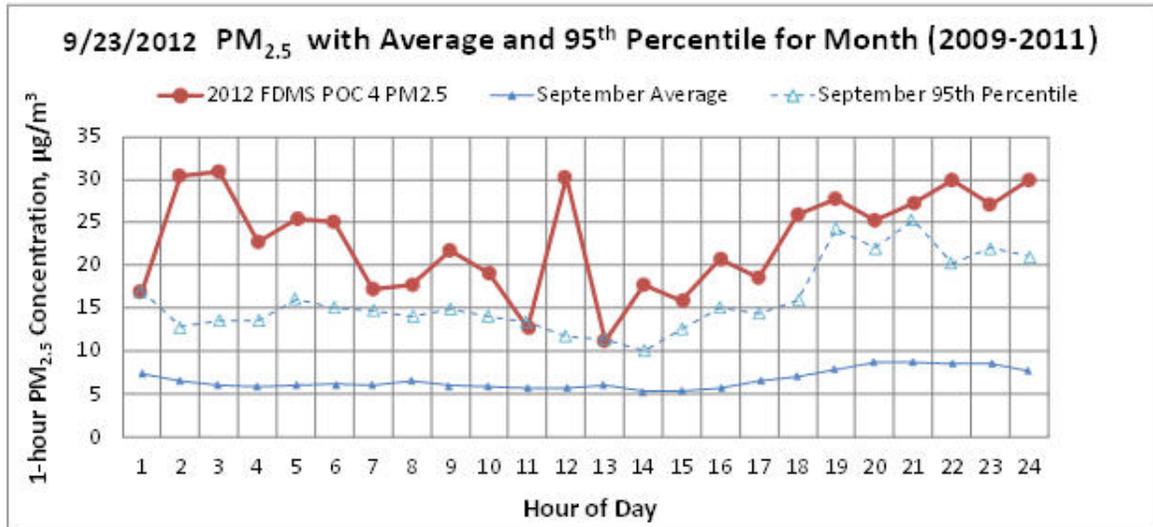




September 23, 2012

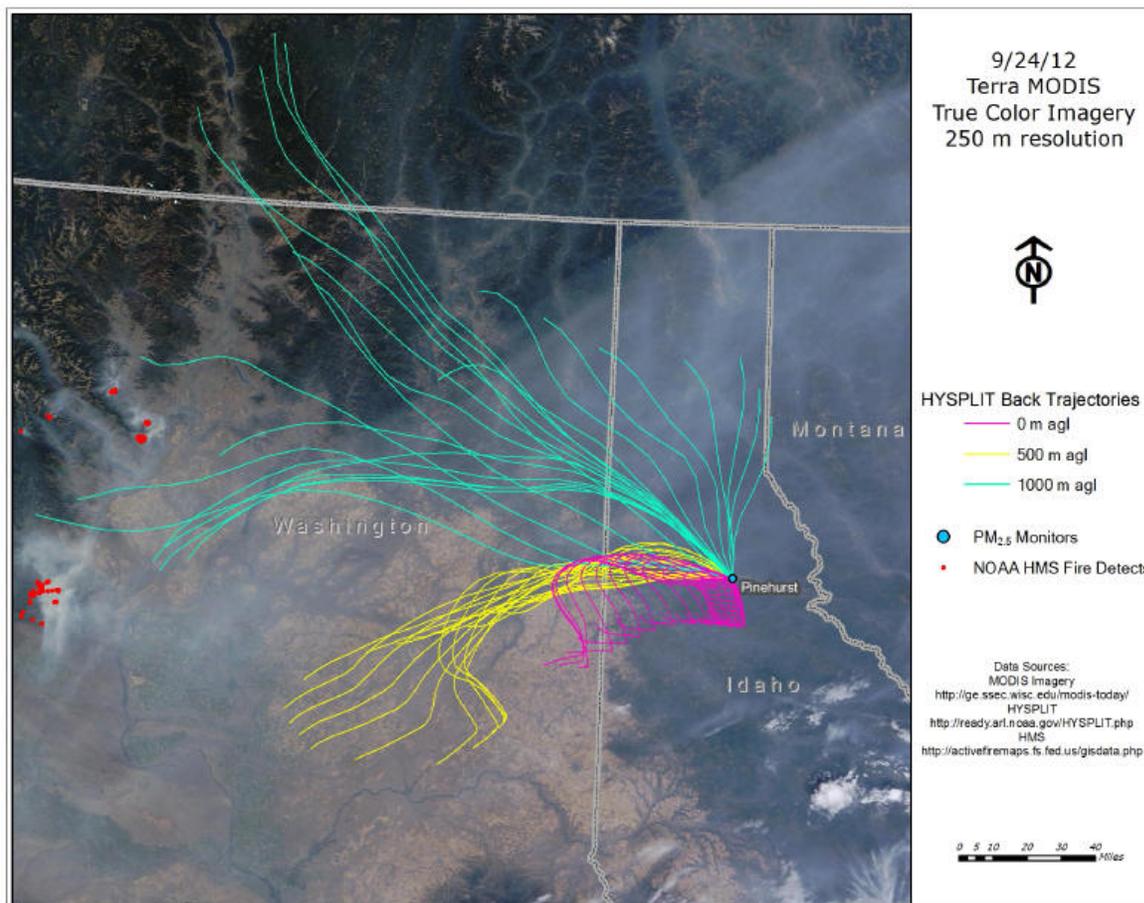
Summary of EER Evidence for Pinehurst Monitor Value, 22.8 $\mu\text{g}/\text{m}^3$ on 9-23-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; >86 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2 (See Sec. 4)
	Weather Conditions:	Approaching upper level low pressure system provides W/SW wind direction while upper level ridge is suppressed and pushed to the east.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows dense smoke engulfing the region. Back trajectories recirculate local smoke and cover little ground during the 24-hour period, suggesting stagnant conditions. Hourly trace shows higher values during the nighttime hours, all at or above the 95 th percentile values for September, with some clearing and a spike at midday. Wind speeds are low.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. Stage 1 Forecast/Caution in effect, prohibiting open burning of any kind. See Sec. 4
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/ HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95 th tile), thus, this event contributed 7.8 to 15.8 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	Notification of Stage 1 Forecast/Caution advised residents of protective actions.

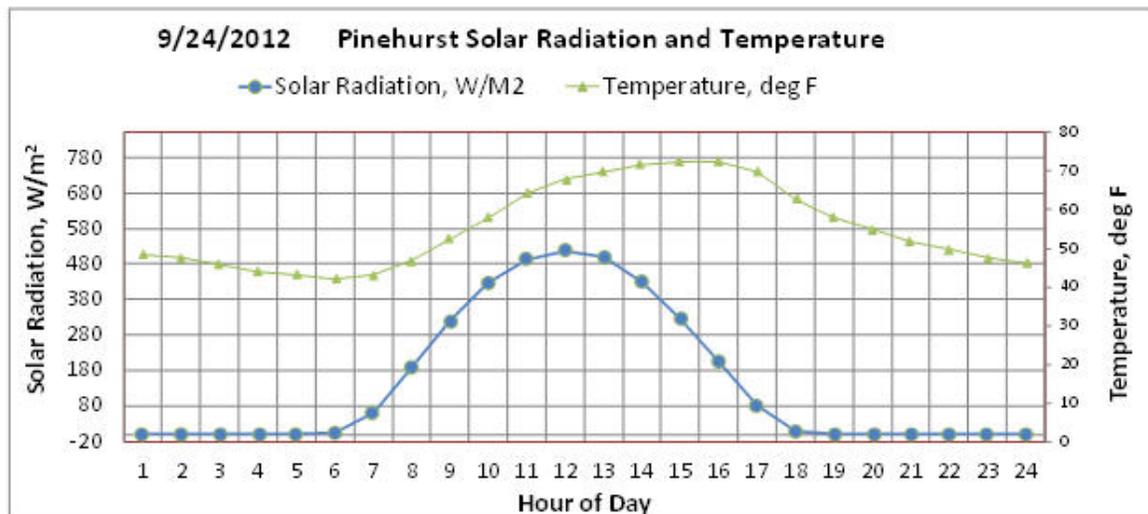
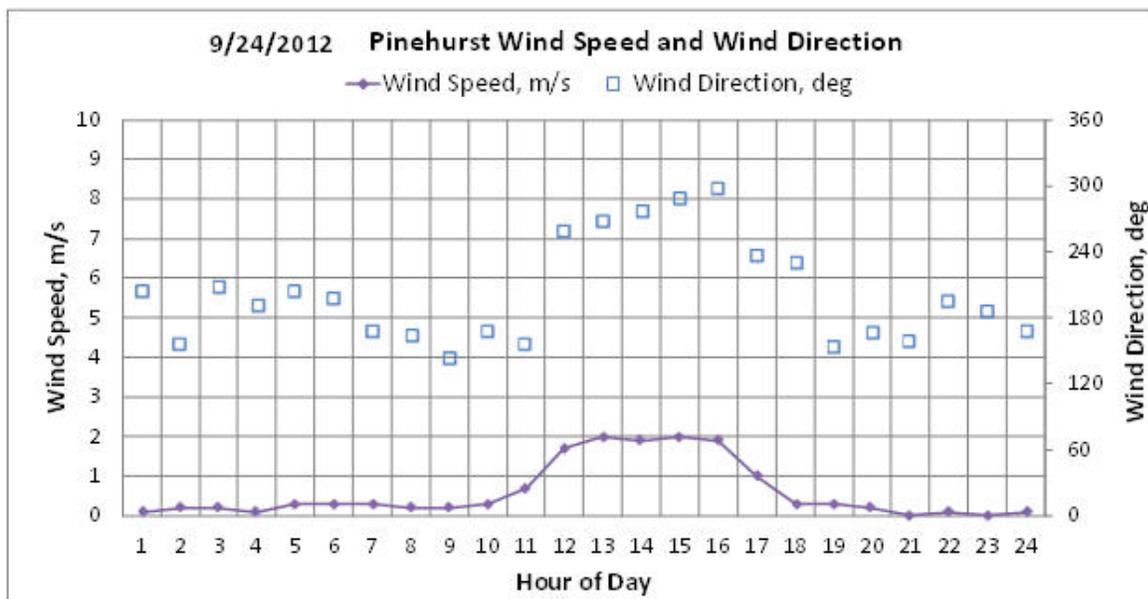
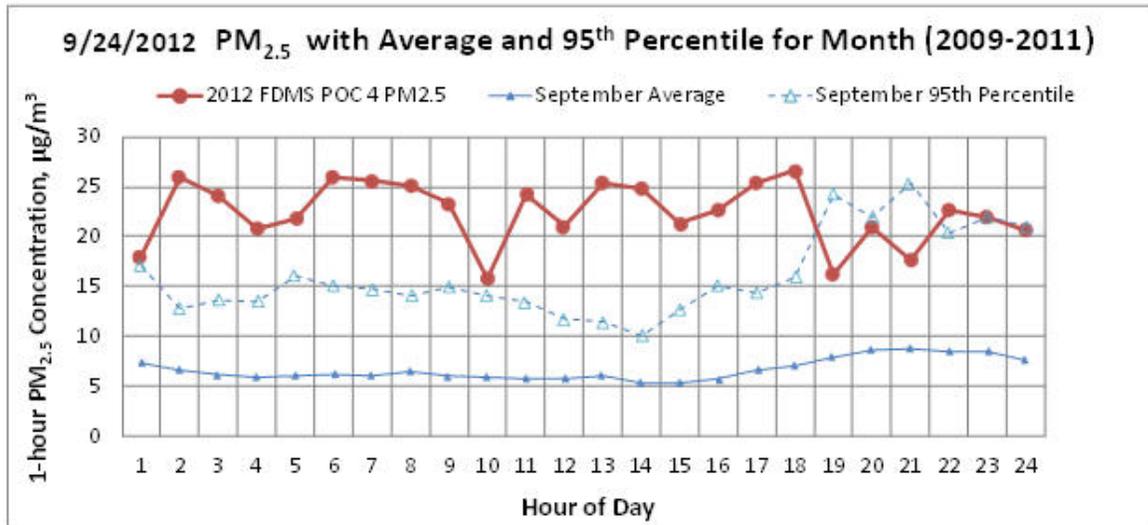




September 24, 2012

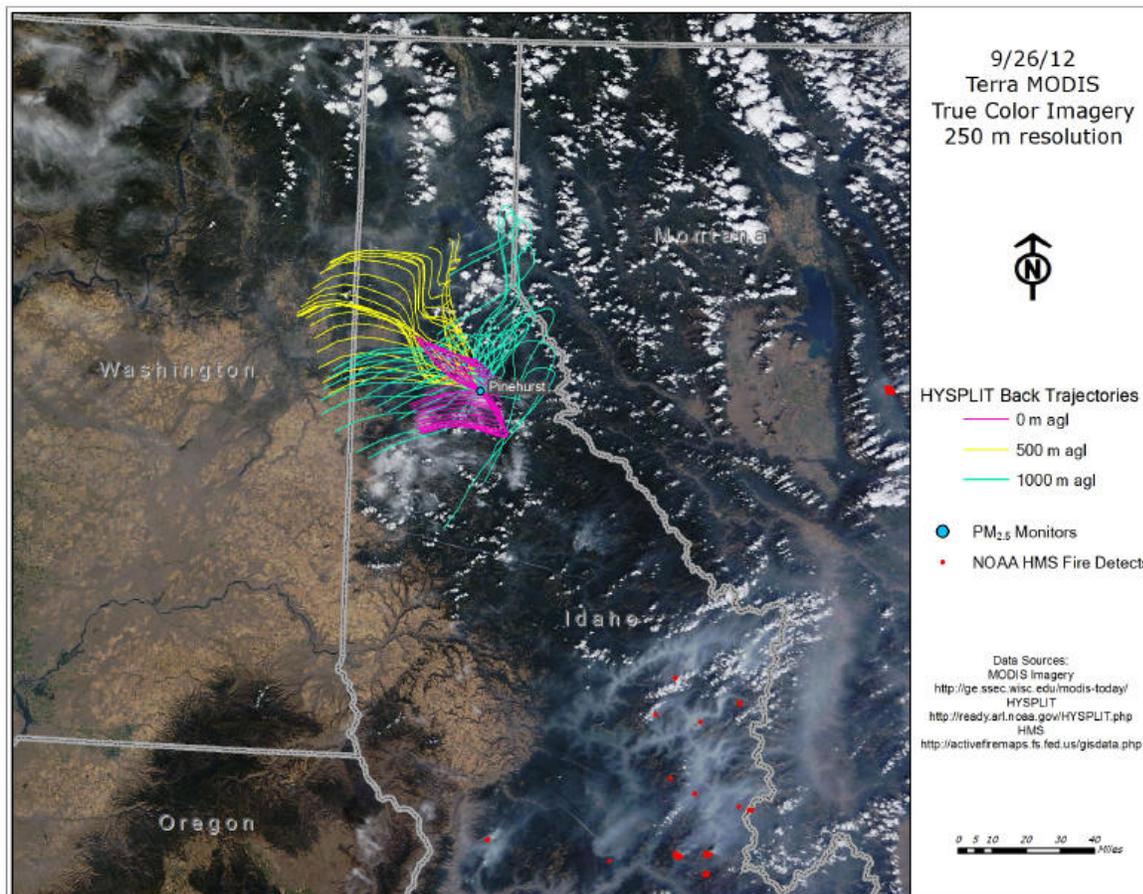
Summary of EER Evidence for Pinehurst Monitor Value, 22.4 $\mu\text{g}/\text{m}^3$ on 9-24-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; >85 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2 (See Sec. 4)
	Weather Conditions:	Upper level low moves over NV/OR/ID border allowing W/NW flow to advect smoke from WA into northern Idaho once more.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows moderate smoke across the region. Back trajectories intersect smoke and/or fire detects from the Taylor Bridge and Wenatchee (WA) fires. Hourly trace is variable, fluctuating between 15 and 27 $\mu\text{g}/\text{m}^3$ all day and above the 95 th percentile hourly values for September for most of the day.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. Stage 1 Forecast/Caution in effect, prohibiting open burning of any kind. See Sec. 4
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/ HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 7.4 to 15.4 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	Notification of Stage 1 Forecast/Caution advised residents of protective actions.

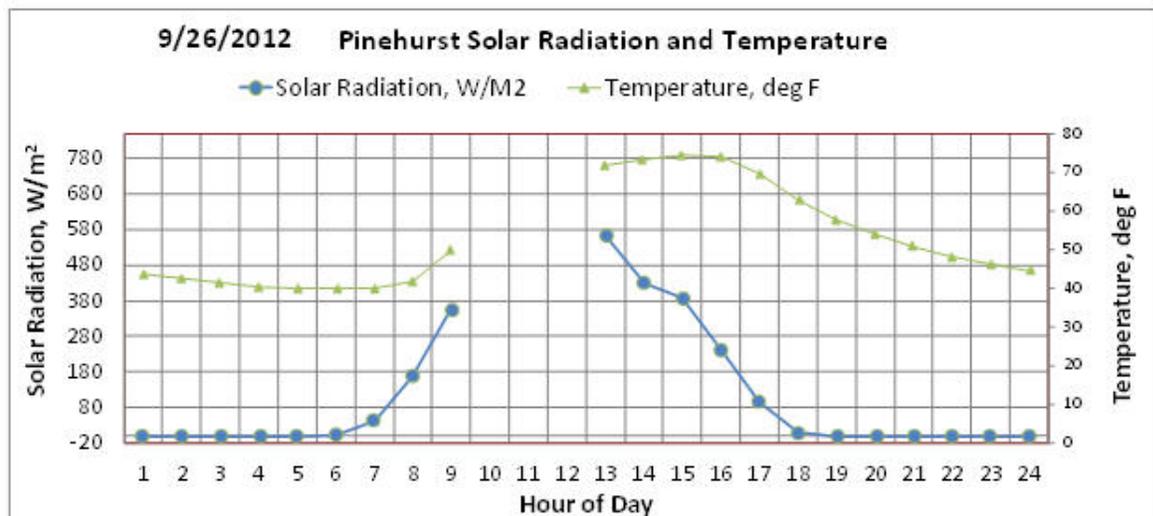
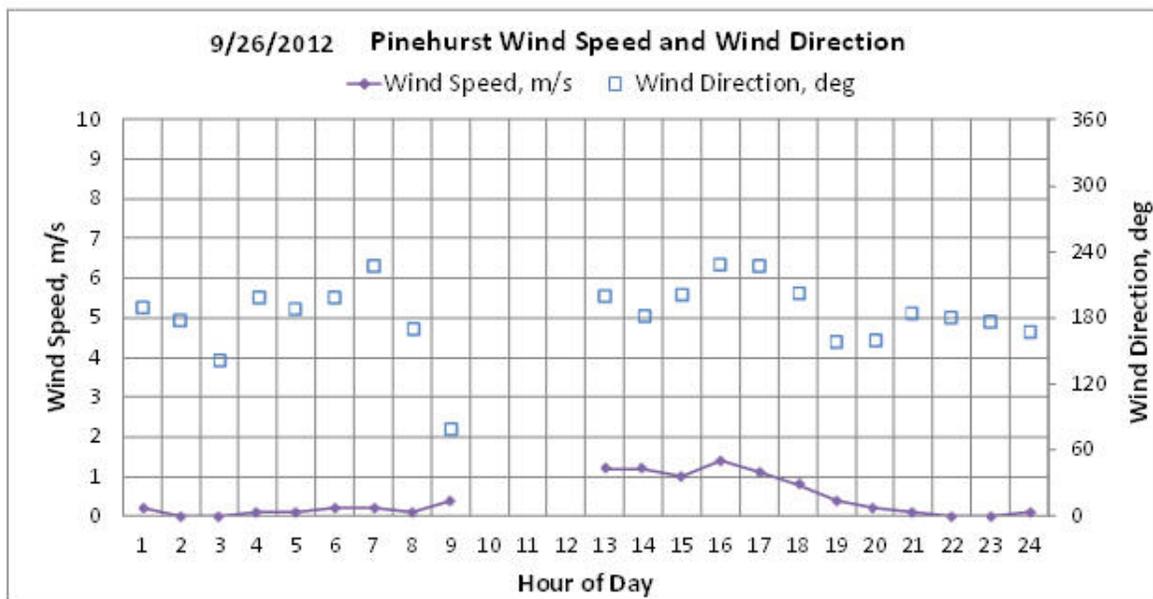
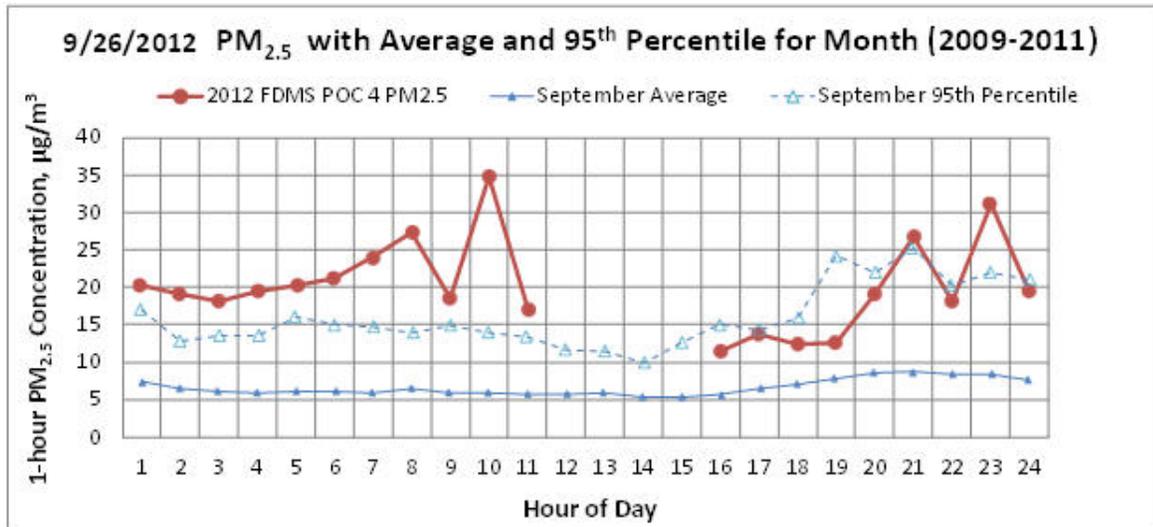




September 26, 2012

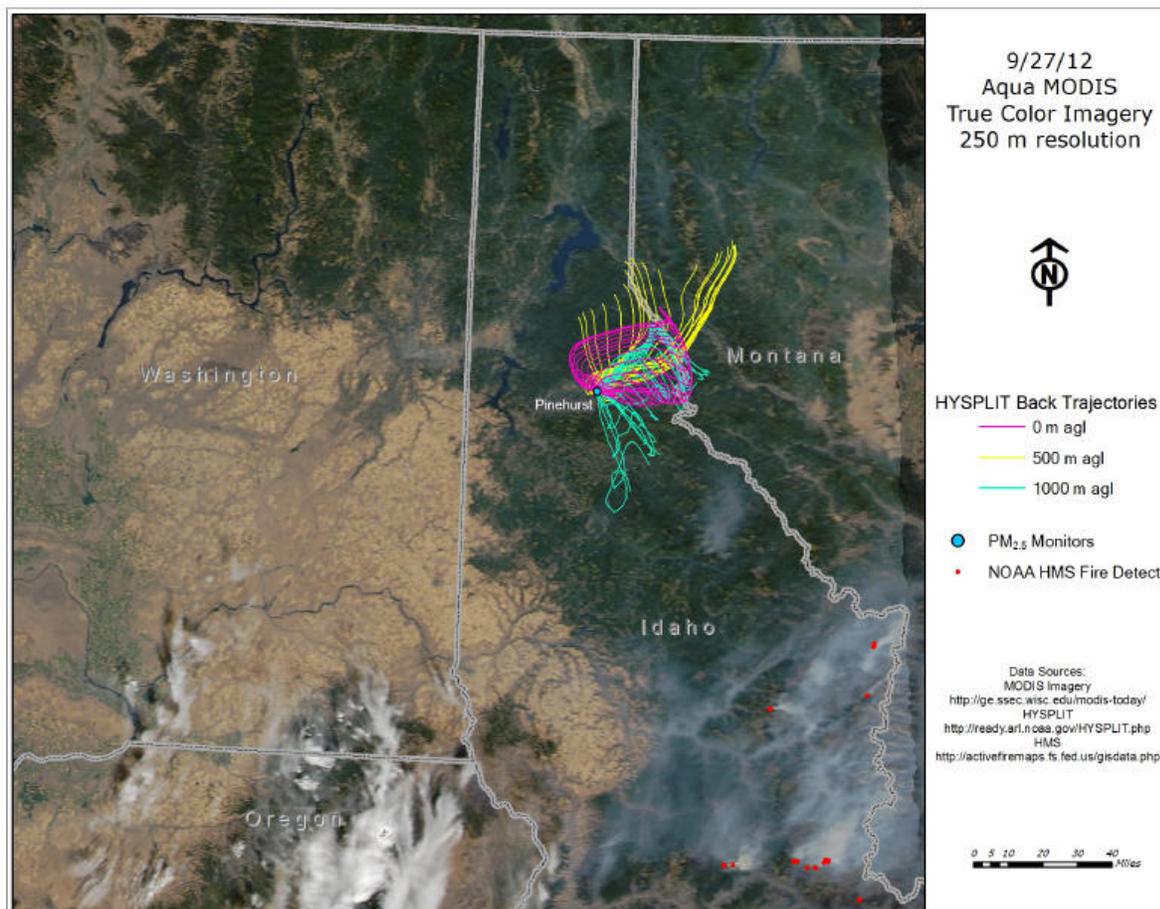
Summary of EER Evidence for Pinehurst Monitor Value, 20.2 $\mu\text{g}/\text{m}^3$ on 9-26-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; >82 nd percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 2 (See Sec. 4)
	Weather Conditions:	Embedding shortwave now located over western MT as ridge develops over WA. Lack of upper-level dynamics allow local, orographically-driven winds to be primary.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows some smoke to the north of Pinehurst and sunk into drainages to the south. Back trajectories intersect no fire detects. Back trajectories show very little movement during the 24-hour period, suggesting stagnant conditions which trapped levels above the 95 th percentile September hourly values through 1100. Hourly trace hovers from 12 to 30 $\mu\text{g}/\text{m}^3$ for most of the day. Wind speeds are quite low.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. Stage 1 Forecast/Caution in effect, prohibiting open burning of any kind. See Sec. 4
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/ HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 5.2 to 13.2 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	Notification of Stage 1 Forecast/Caution advised residents of protective actions.

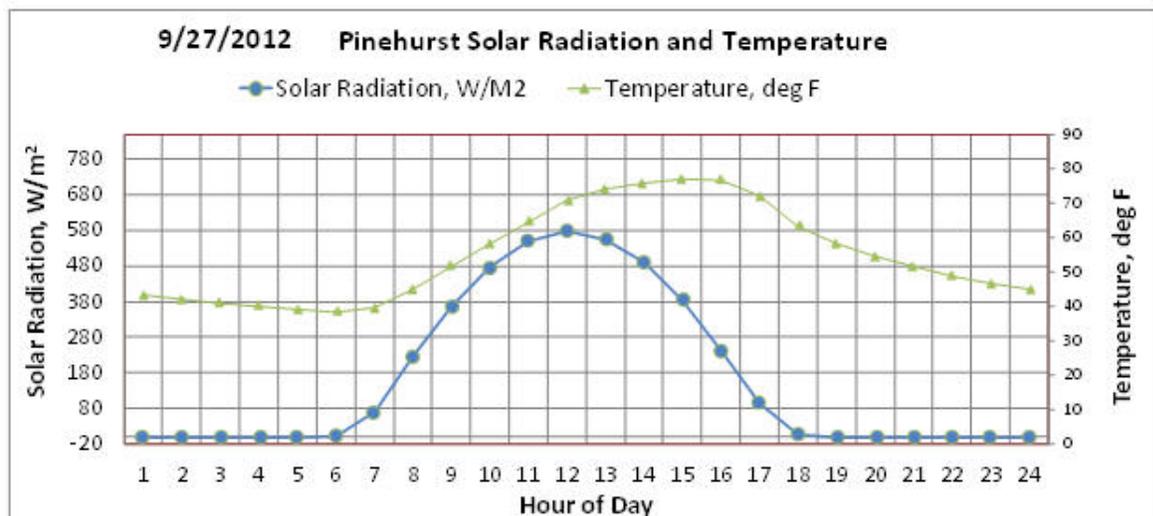
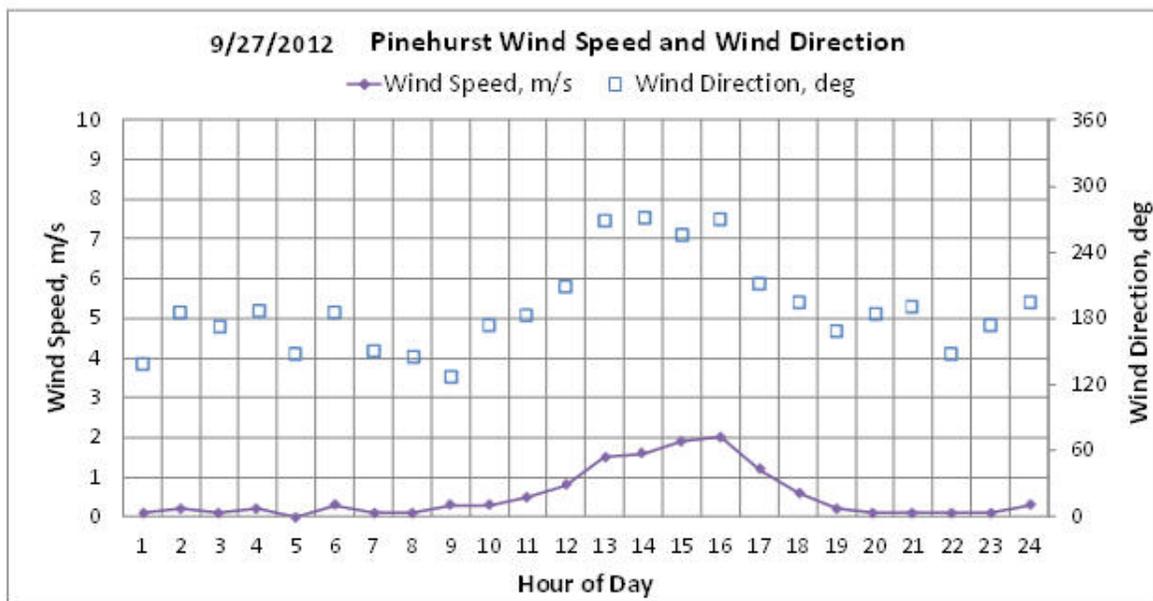
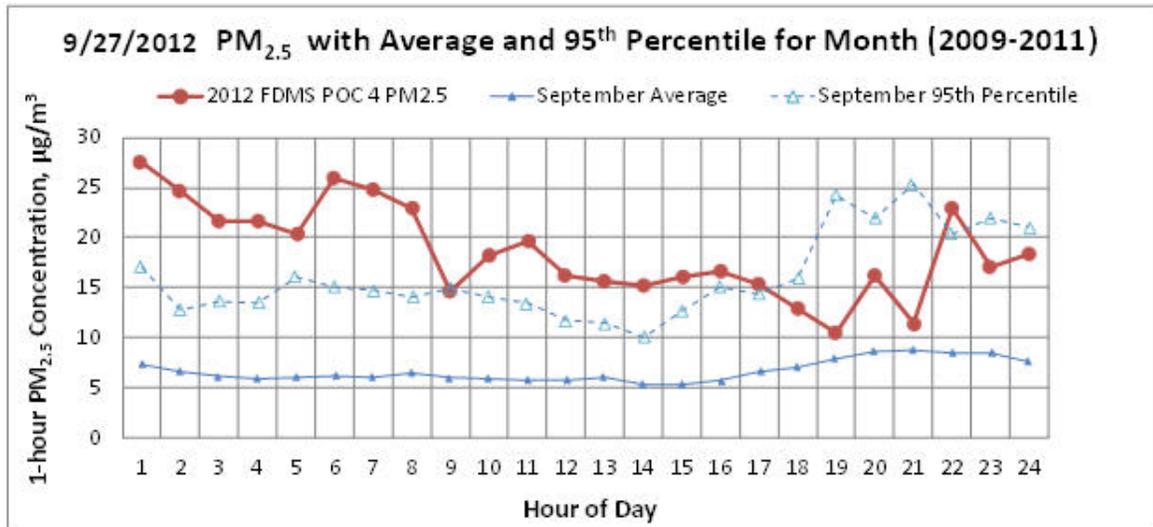




September 27, 2012

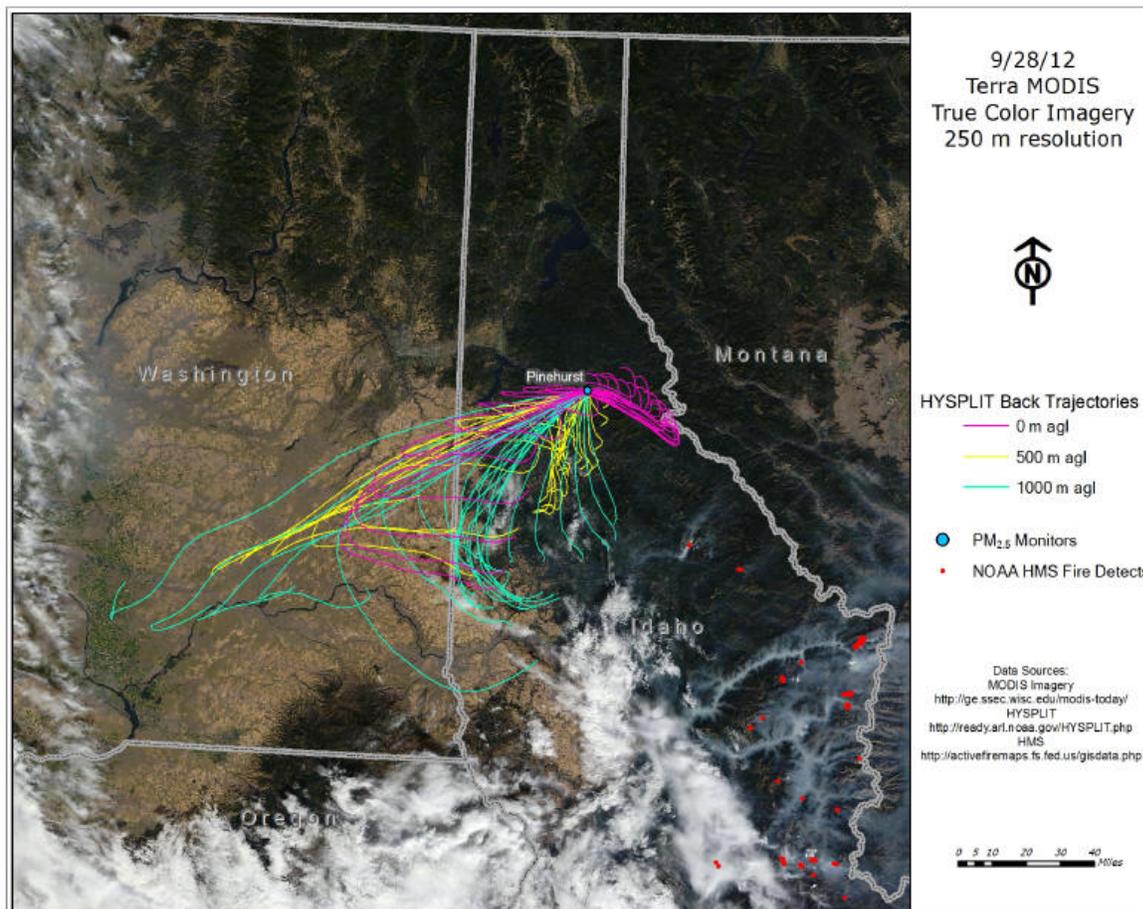
Summary of EER Evidence for Pinehurst Monitor Value, 18.5 $\mu\text{g}/\text{m}^3$ on 9-27-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; >78 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 2 (See Sec. 4)
	Weather Conditions:	Weak upper level pressure gradients under ridge axis limit wind speeds and lack any defined direction. Local winds are primary drivers.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows very light smoke in the Pinehurst area. Back trajectories intersect no fire detects and show very little movement during the 24-hour period, suggesting stagnant conditions. Hourly trace hovers around 20 $\mu\text{g}/\text{m}^3$ for most of the day with morning levels well above the 95 th percentile hourly $\text{PM}_{2.5}$ values for September. Wind speeds are still low.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. Stage 1 Forecast/Caution in effect, prohibiting open burning of any kind. See Sec. 4
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/ HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 3.5 to 11.5 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	Notification of Stage 1 Forecast/Caution advised residents of protective actions.

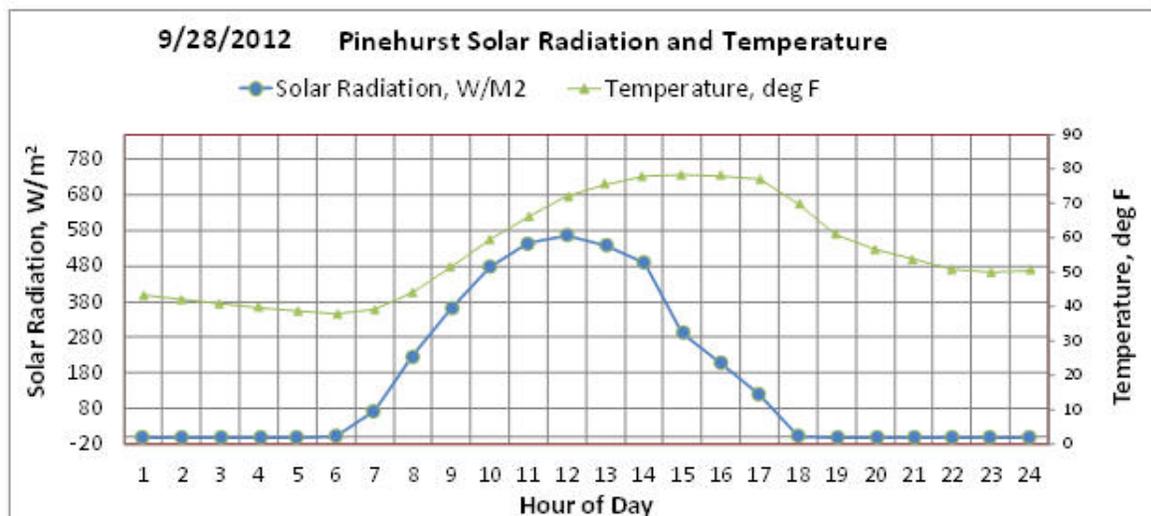
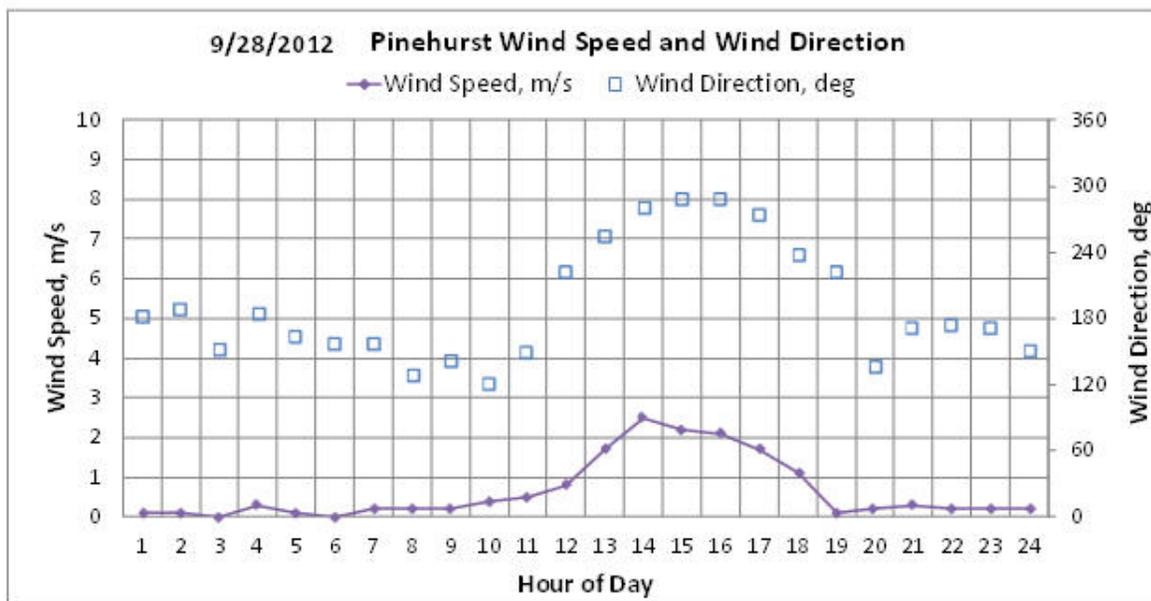
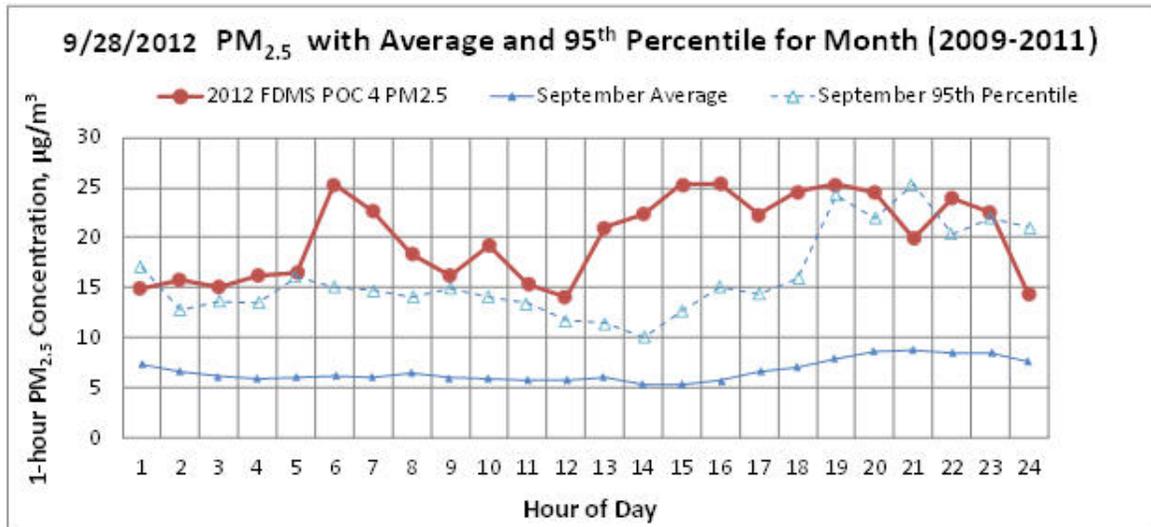




September 28, 2012

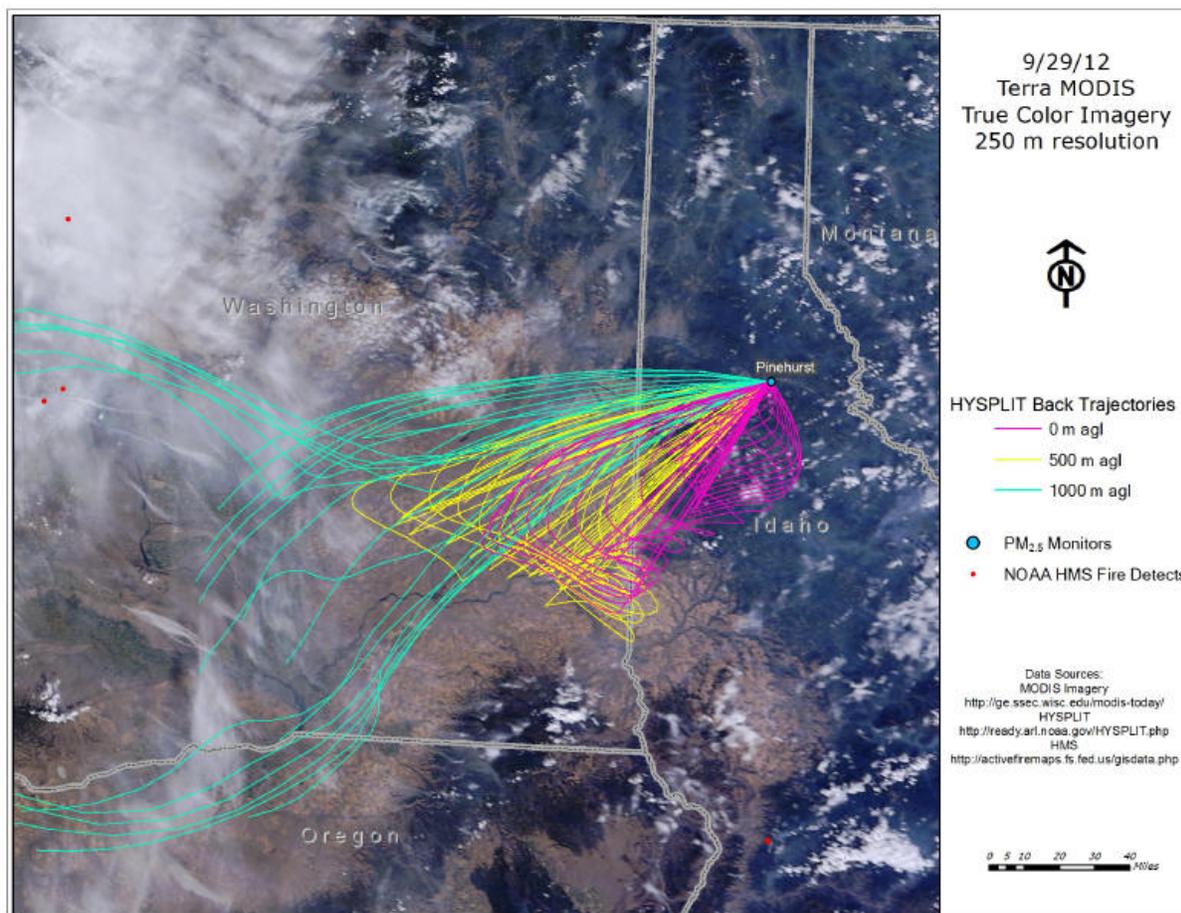
Summary of EER Evidence for Pinehurst Monitor Value, 20.0 $\mu\text{g}/\text{m}^3$ on 9-28-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; >82 nd percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 2 (See Sec. 4)
	Weather Conditions:	Ridge axis shifts to the east providing weak SW flow into Idaho.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows no smoke in the Pinehurst area. Back trajectories intersect no fire detects. Surface trajectories move up and down the Silver Valley, recirculating whatever smoke remains from previous day. Hourly trace varies between 15 and 25 $\mu\text{g}/\text{m}^3$ for most of the day, largely above the 95 th percentile $\text{PM}_{2.5}$ values for September.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. No CRB in Kootenai, Shoshone or Benewah Co. See Sec. 4.10.5 and 4.11.5.
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/ HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 5 to 13 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	Notification of Stage 1 Forecast/Caution advised residents of protective actions.

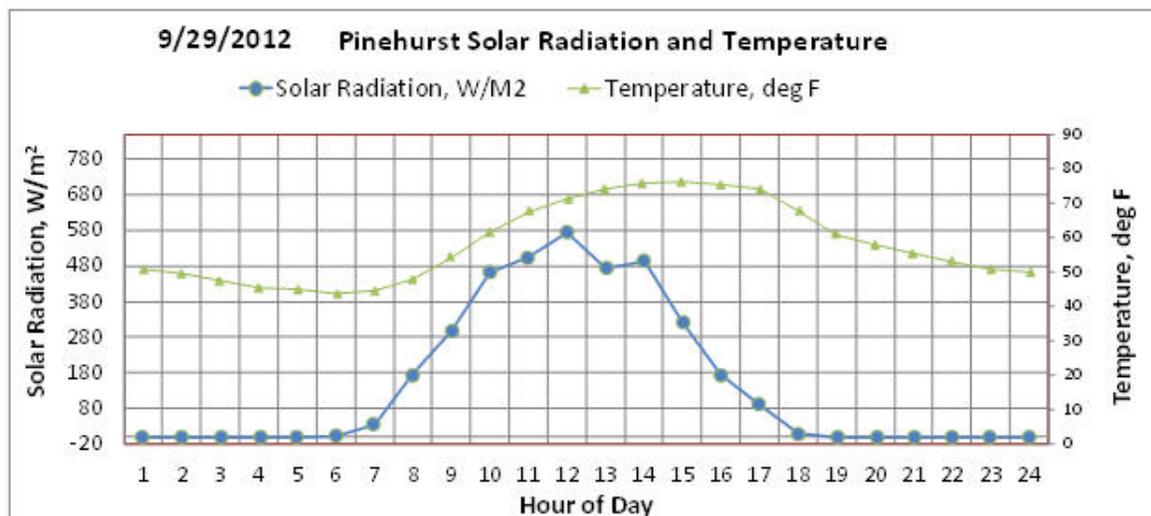
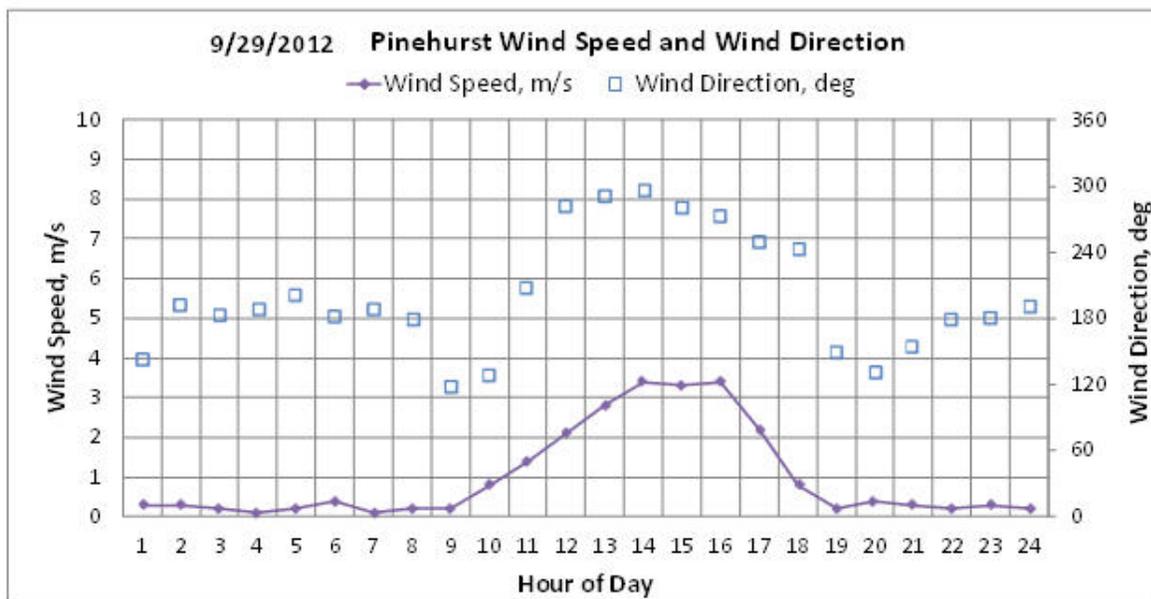
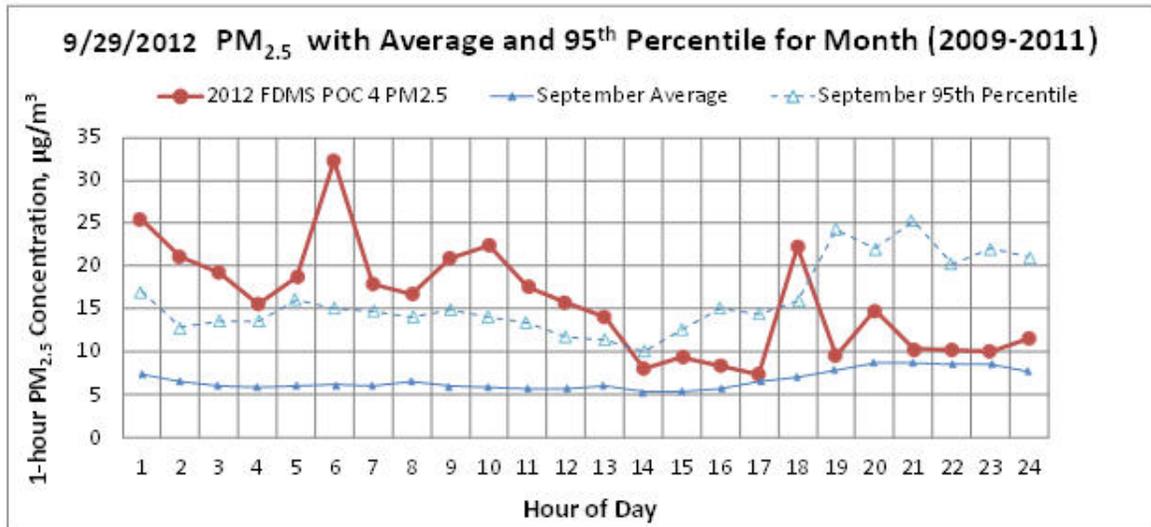




September 29, 2012

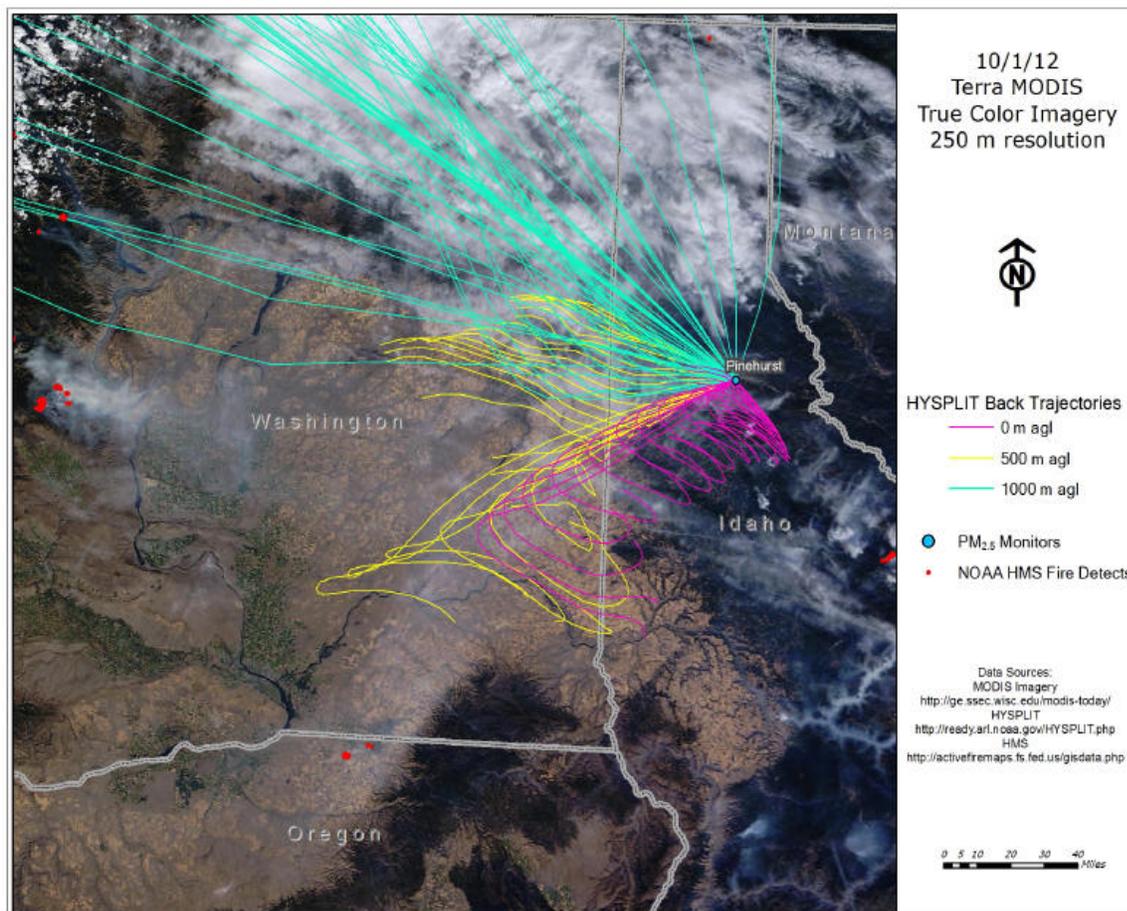
Summary of EER Evidence for Pinehurst Monitor Value, 15.8 $\mu\text{g}/\text{m}^3$ on 9-29-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>96 th percentile seasonally; >73 rd percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2 (See Sec. 4)
	Weather Conditions:	Developing shortwave trough over MT suppresses ridge and brings in W/SW flow into northern Idaho.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows light smoke and intermittent cloud. Back trajectories intersect smoke and/or fire detects from the Table Mountain and Wenatchee (WA) fires. Hourly $\text{PM}_{2.5}$ trace spikes at 0600 and again at 1800 remaining above the 95 th percentile hourly values for September much of the day.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. No CRB in Kootenai, Shoshone or Benewah Co (Saturday) See Sec. 4.10.5 and 4.11.5.
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 0.8 to 8.8 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	DEQ provided information via news on Sept 27 reducing wildfire smoke exposure.

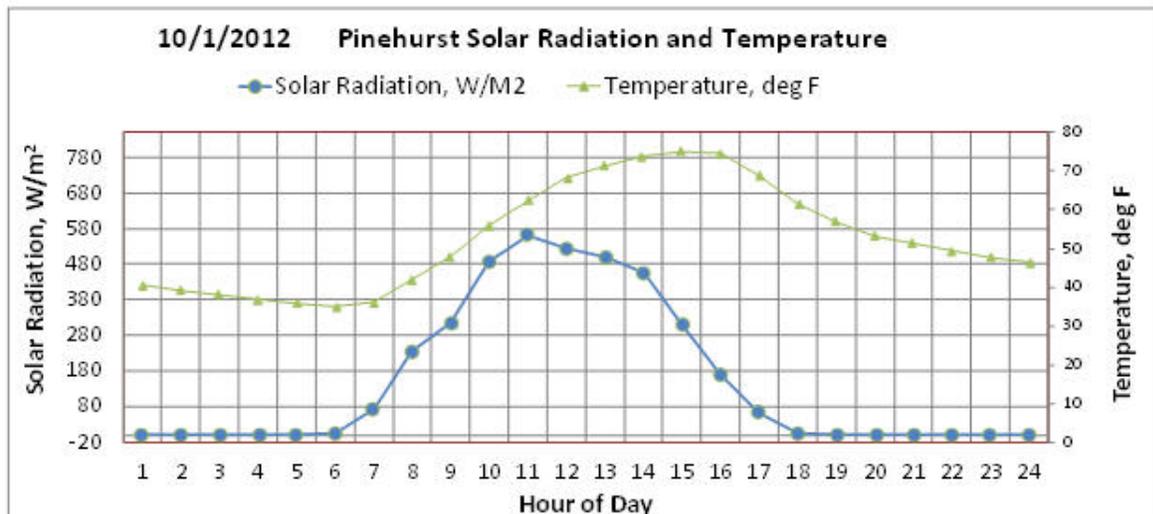
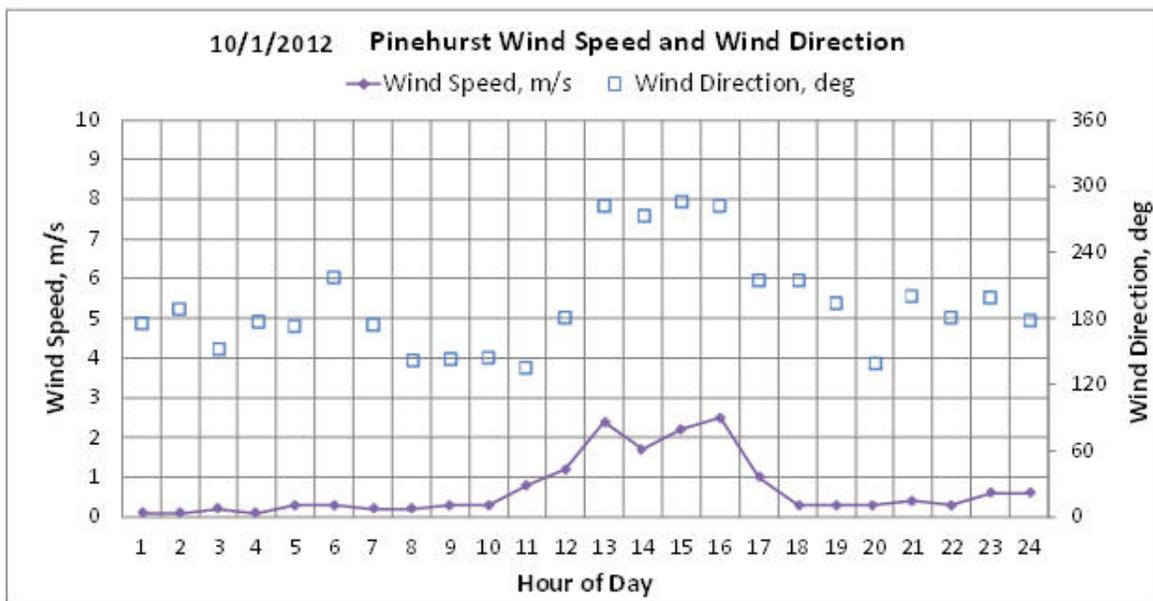
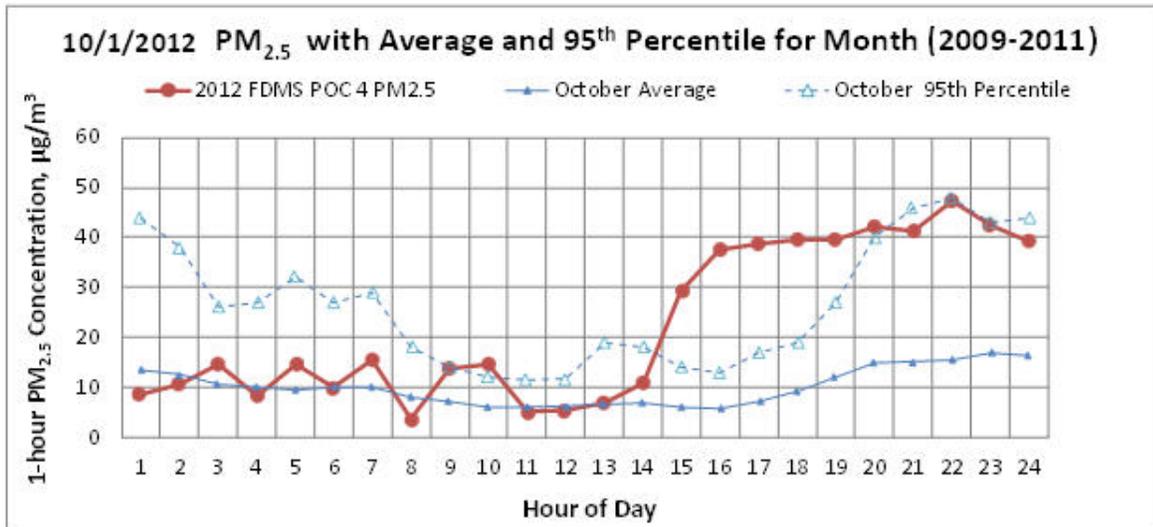




October 1, 2012

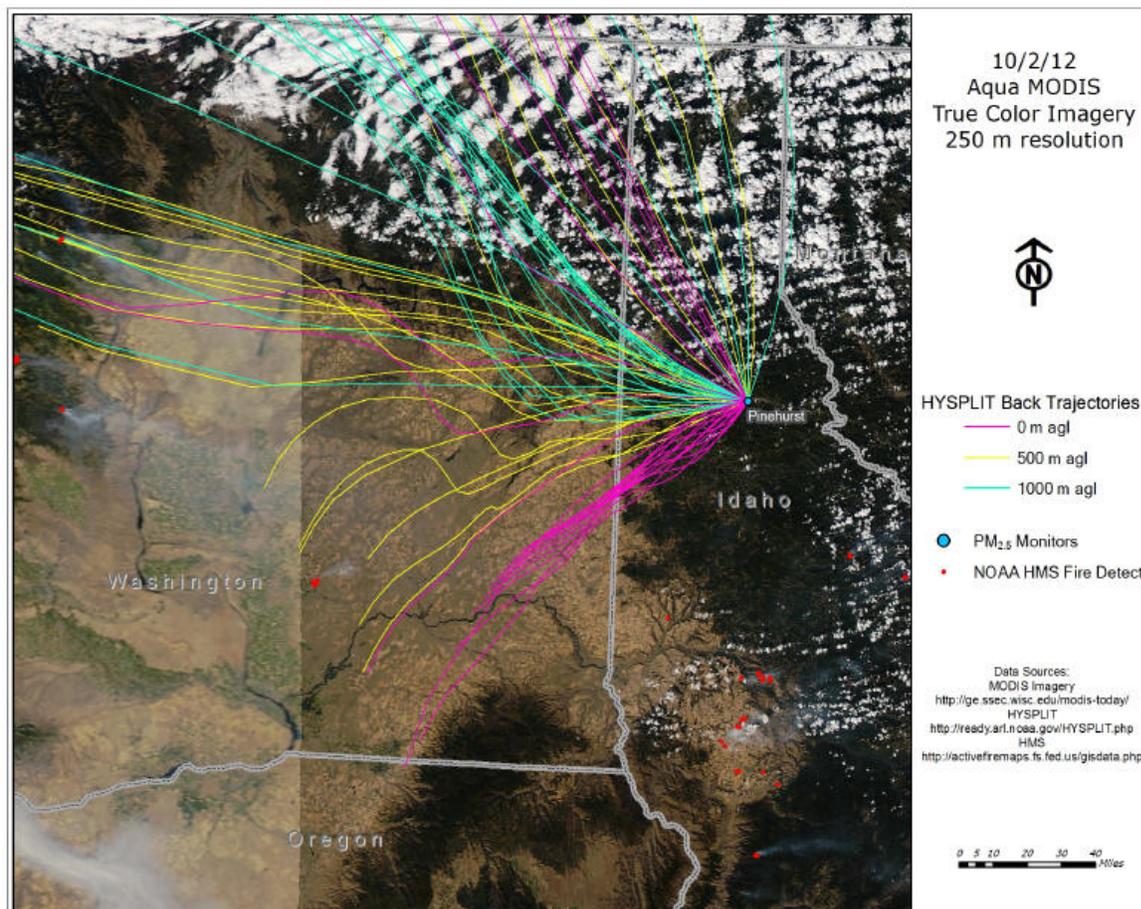
Summary of EER Evidence for Pinehurst Monitor Value, 22.4 $\mu\text{g}/\text{m}^3$ on 10-1-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; >85 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2 (See Sec. 4)
	Weather Conditions:	Strong low pressure system located over the SW US shifts zonal pattern to the NW over Idaho. This advects WA smoke into Silver Valley.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows smoke and clouds in northern ID and WA. Back trajectories intersect smoke and/or fire detects from the Table Mountain and Wenatchee (WA) fires. Hourly $\text{PM}_{2.5}$ trace rises significantly at 3 pm with winds from the west and stays high the remainder of the day, well above the hourly 95 th percentile values for October from 1600 – 1900.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. No CRB in Kootenai, Shoshone or Benewah Co. See Sec. 4.10.5 and 4.11.5.
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 7.4 to 15.4 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS “but for” this contribution.
Mitigation:	See Sec 8 and Appendix E	Daily AQI forecast keeps citizens informed. DEQ interview with media 9/27/12.

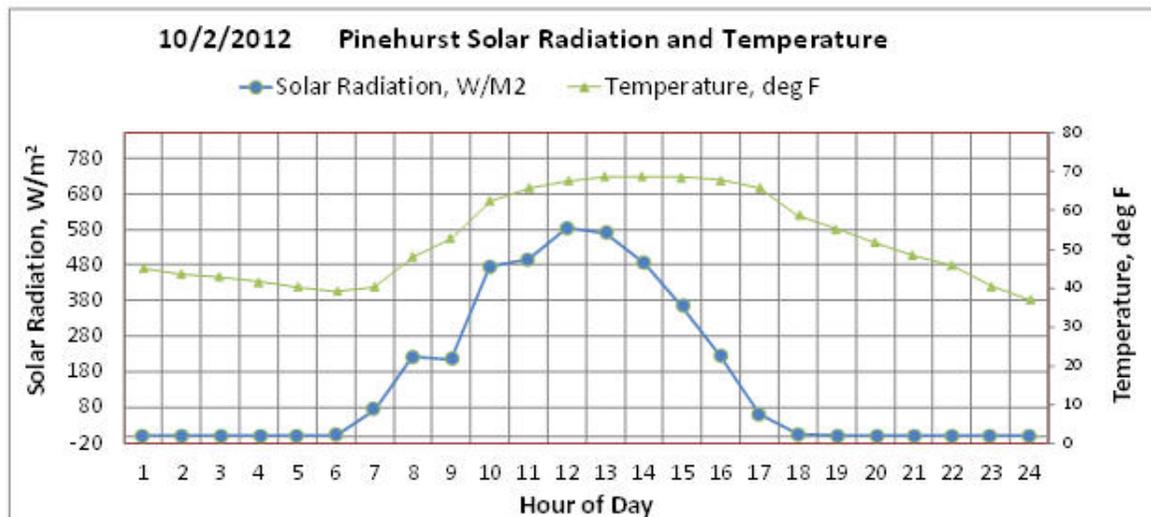
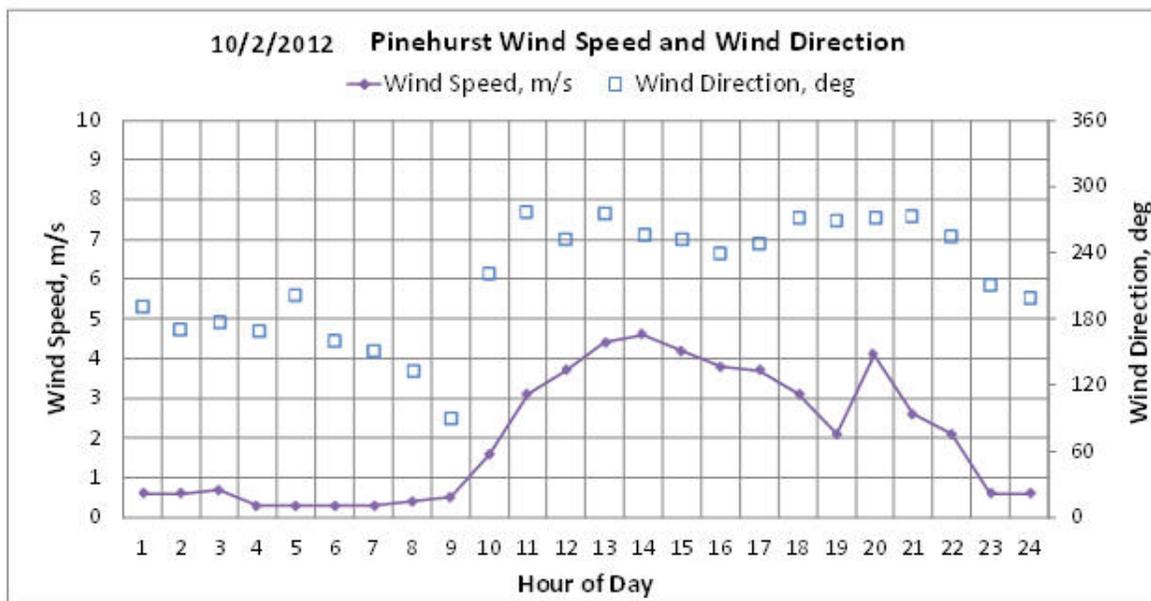
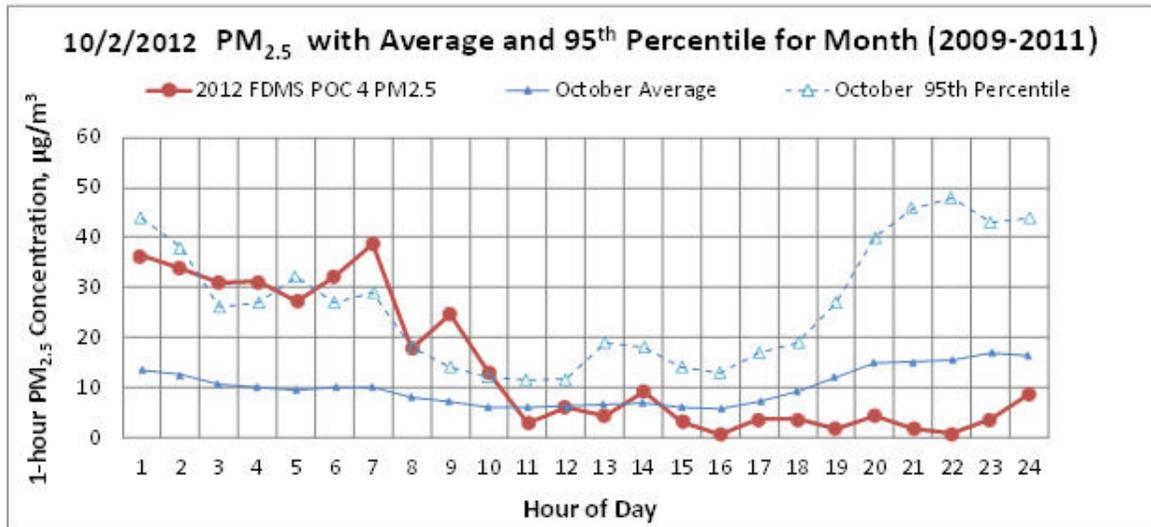




October 2, 2012

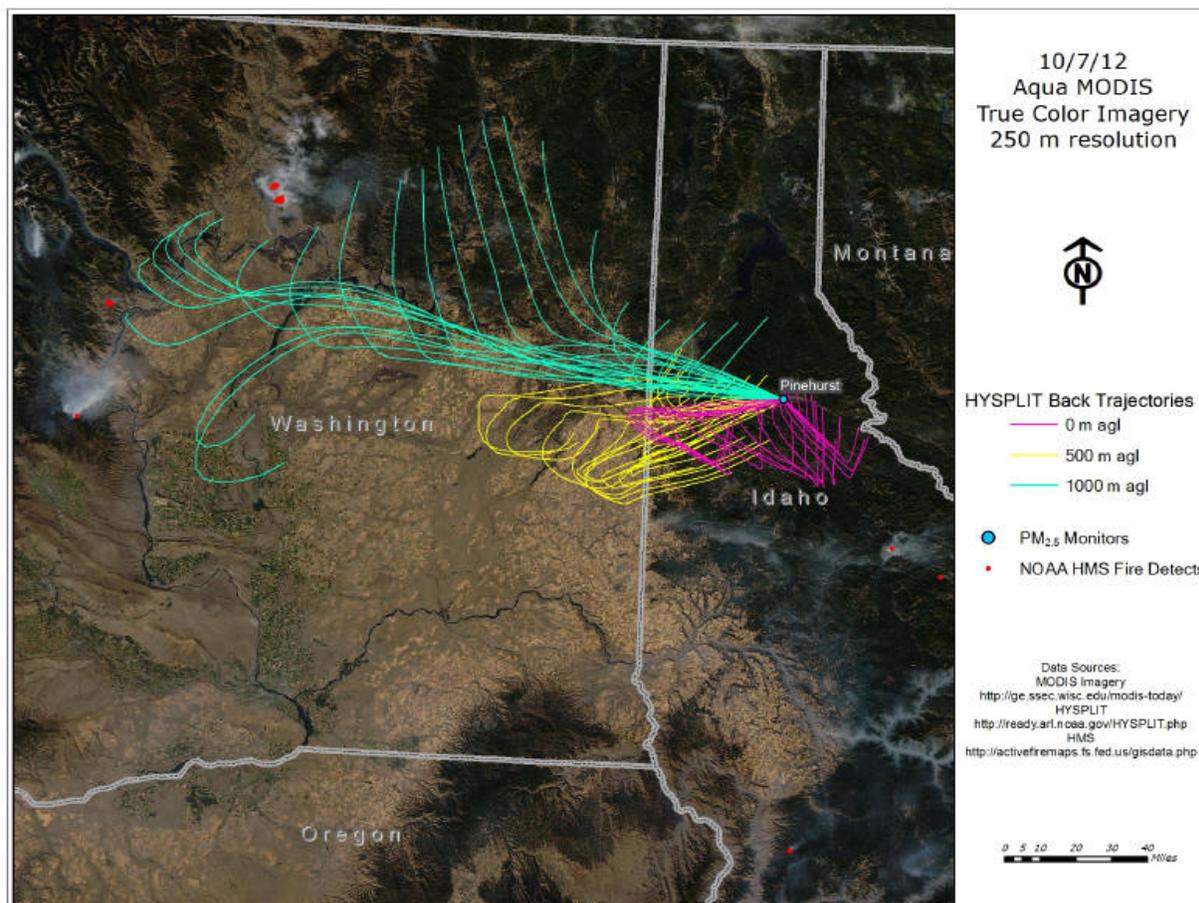
Summary of EER Evidence for Pinehurst Monitor Value, 14.1 $\mu\text{g}/\text{m}^3$ on 10-2-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>93 rd percentile seasonally; >69 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 2 (See Sec. 4)
	Weather Conditions:	Predominately zonal flow with slight wind shift from SW to NW as cold front descends into the extreme northern Panhandle.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows light smoke travelling east from the central WA fires. Back trajectories intersect smoke and/or fire detects from the Table Mountain and Wenatchee (WA) fires. Hourly $\text{PM}_{2.5}$ trace shows high values early in the morning around the 95 th percentile October hourly values, trending down, then clearing when the winds pick up around 1100.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. No CRB in Kootenai, Shoshone or Benewah Co. See Sec. 4.10.5 and 4.11.5.
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed from zero to 7.1 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	Daily AQI forecast.

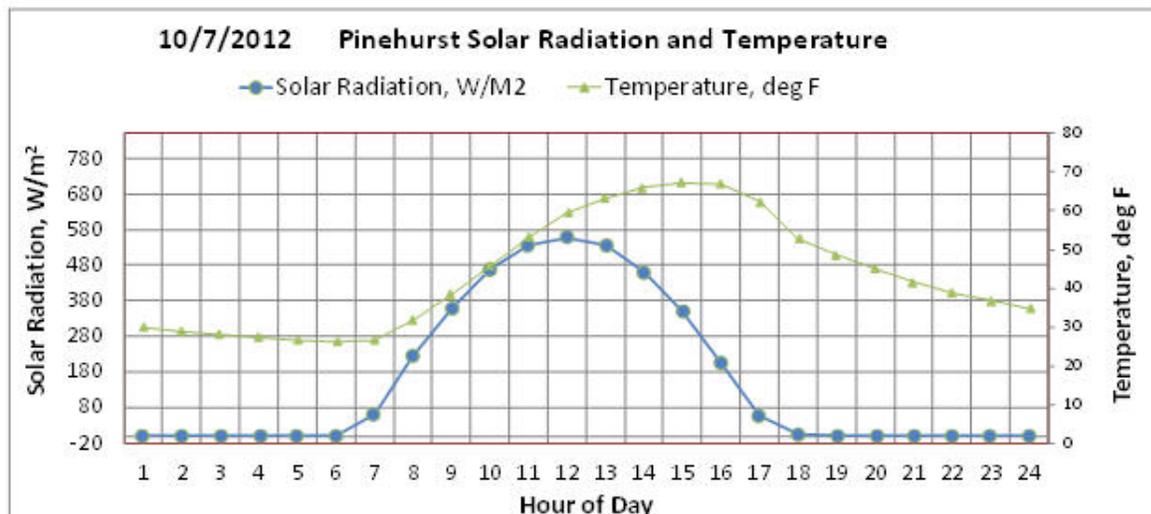
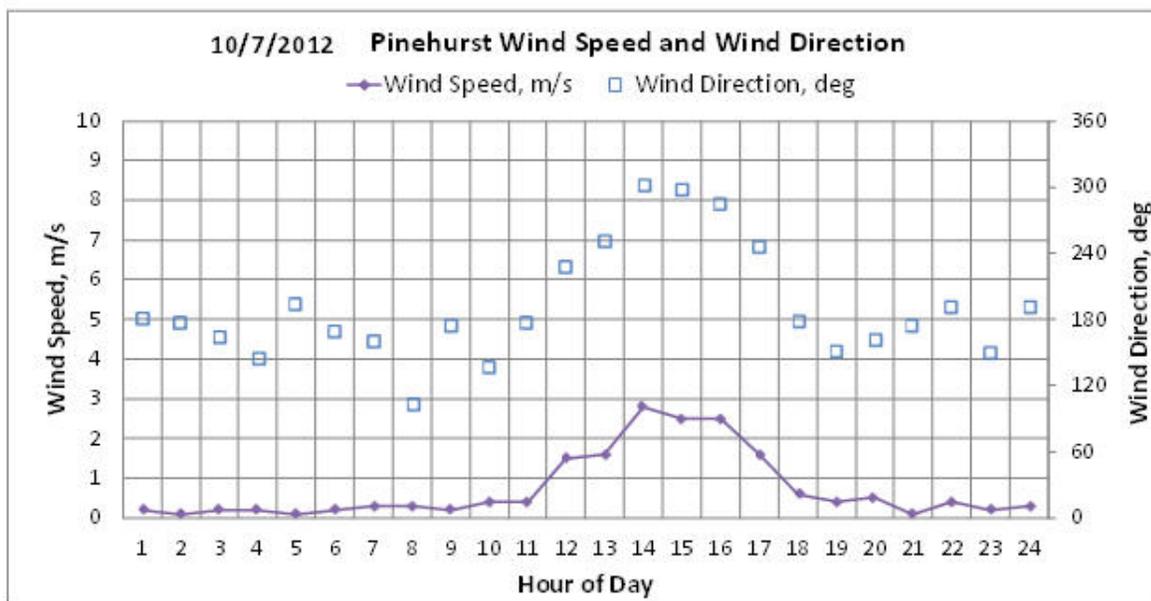
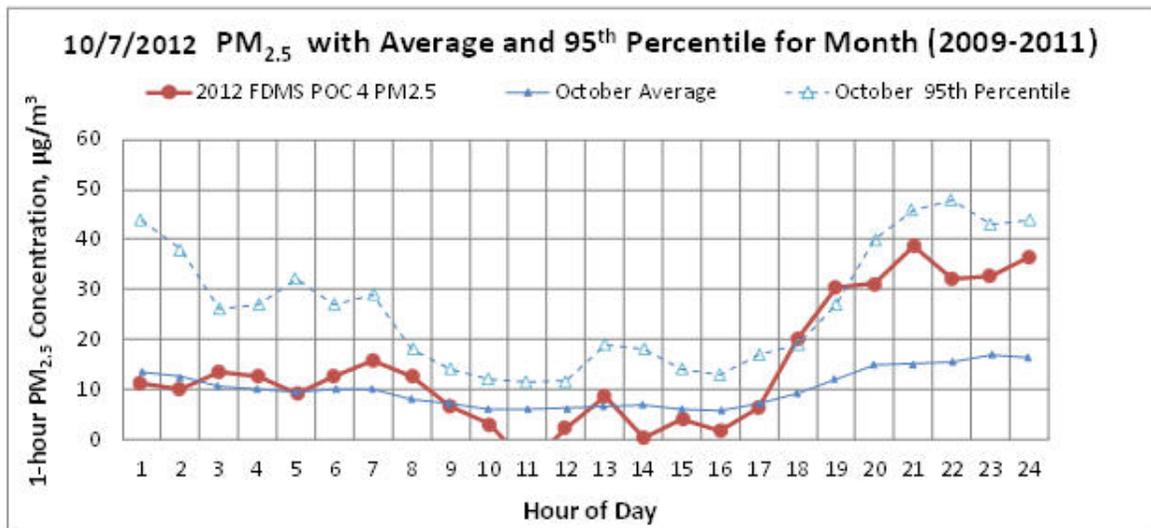




October 7, 2012

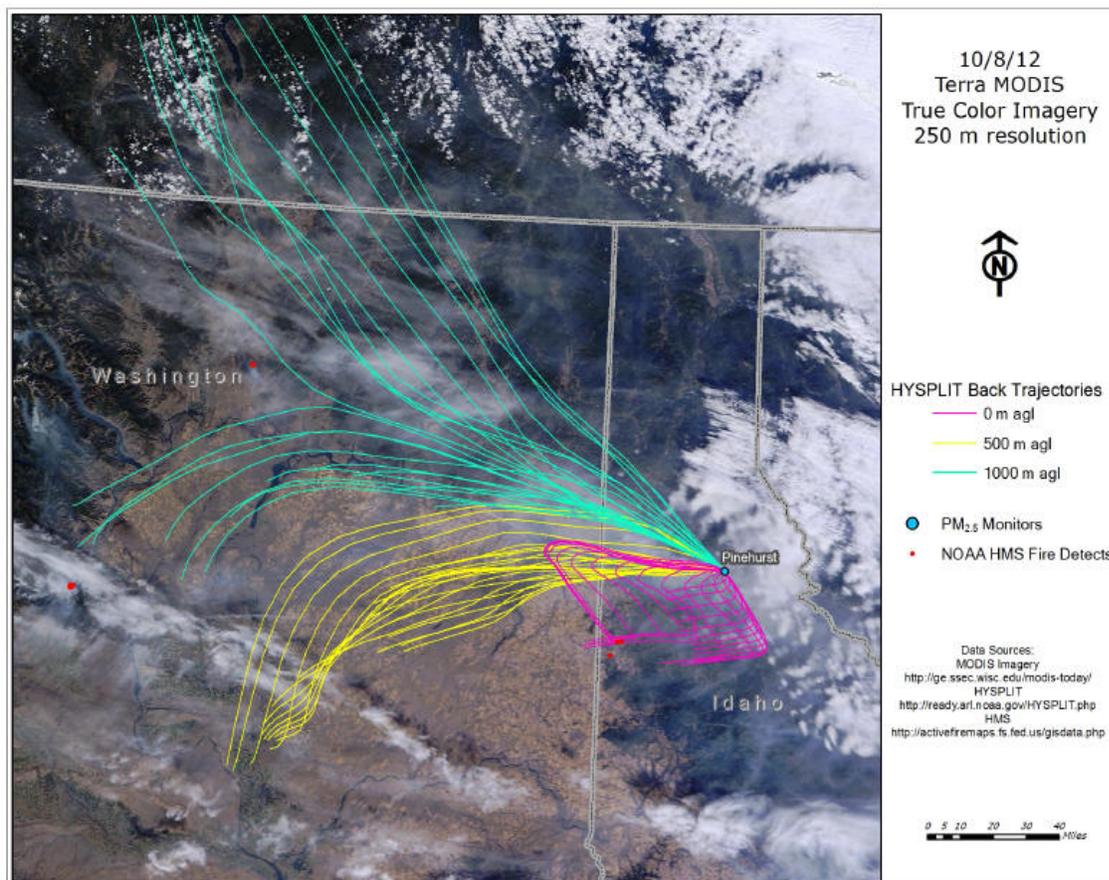
Summary of EER Evidence for Pinehurst Monitor Value, 14.4 $\mu\text{g}/\text{m}^3$ on 10-7-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>94 th percentile seasonally; >69 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1 (See Sec. 4)
	Weather Conditions:	NW flow aloft downstream of moderate rex block located over north Pacific bring light winds. Local terrain-driven winds are primary drivers.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows smoke issuing from fire detects. Back trajectories intersect smoke and/or fire detects from the St. Mary's Mission Road and Wenatchee (WA) fires. Hourly $\text{PM}_{2.5}$ trace rises in the evening and stays high. Night time temperatures are chilly but concentrations are elevated above previous annual averages, near the 95 th percentile hourly averages for October, suggesting a smoke component in addition to home heating emissions.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. No CRB in Kootenai, Shoshone or Benewah Co. See Sec. 4.10.5 and 4.11.5.
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95 th tile), thus, this event contributed from zero to 7.4 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	Daily AQI forecast.

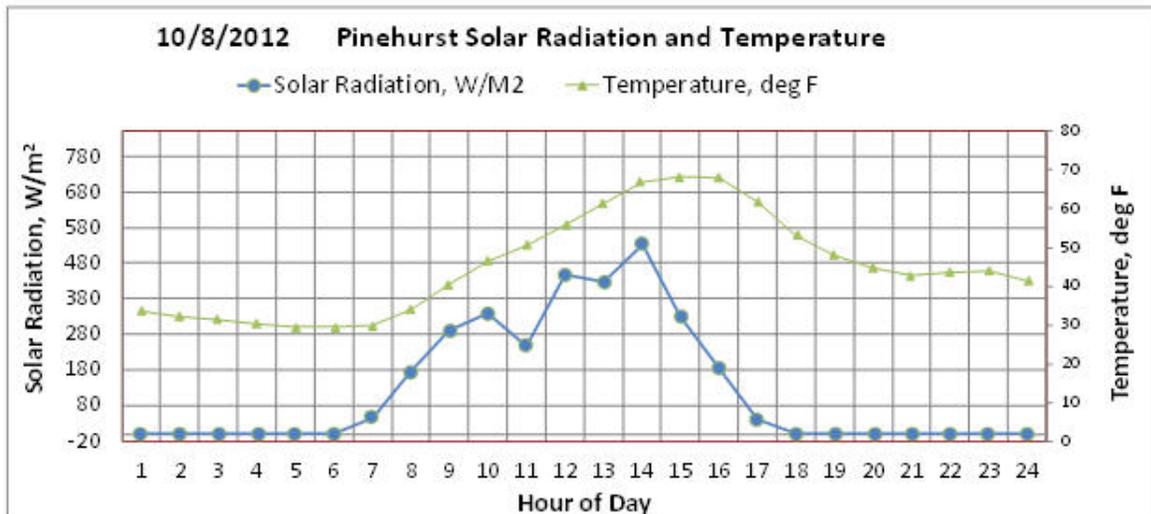
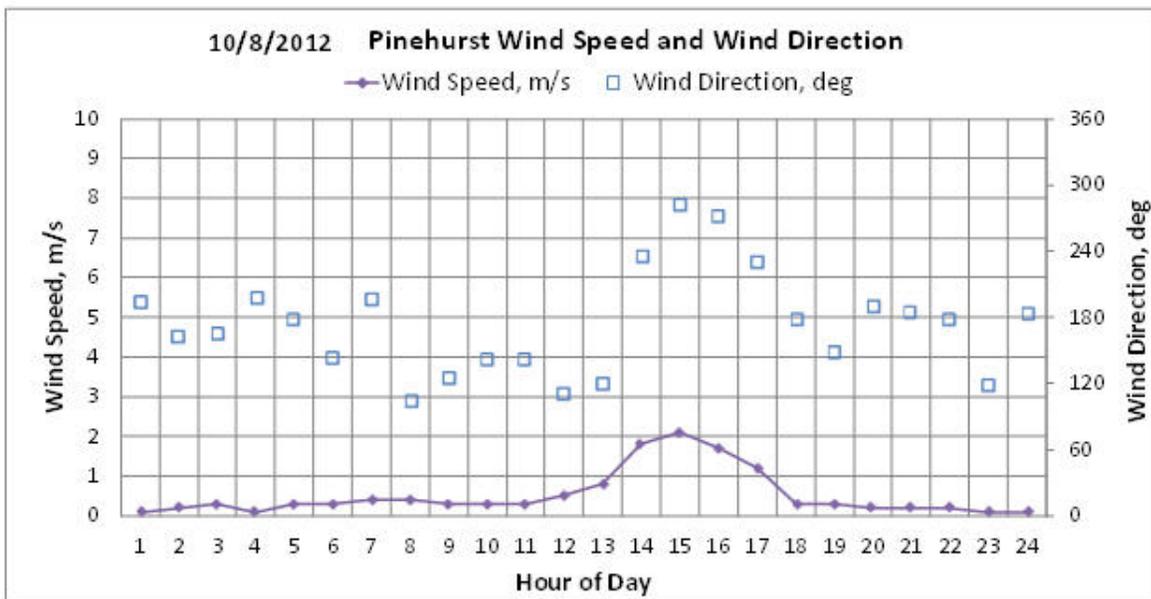
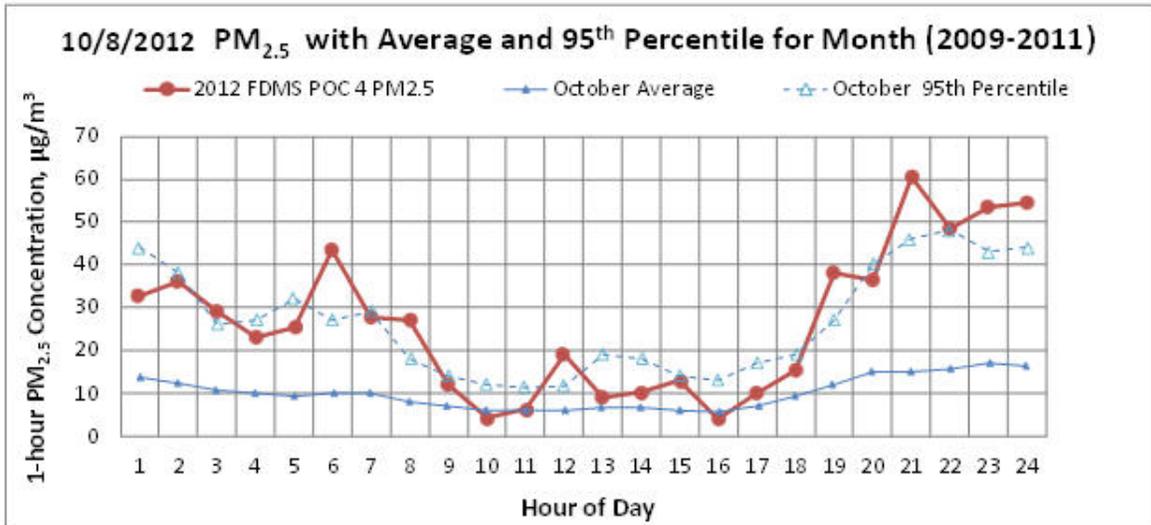




October 8, 2012

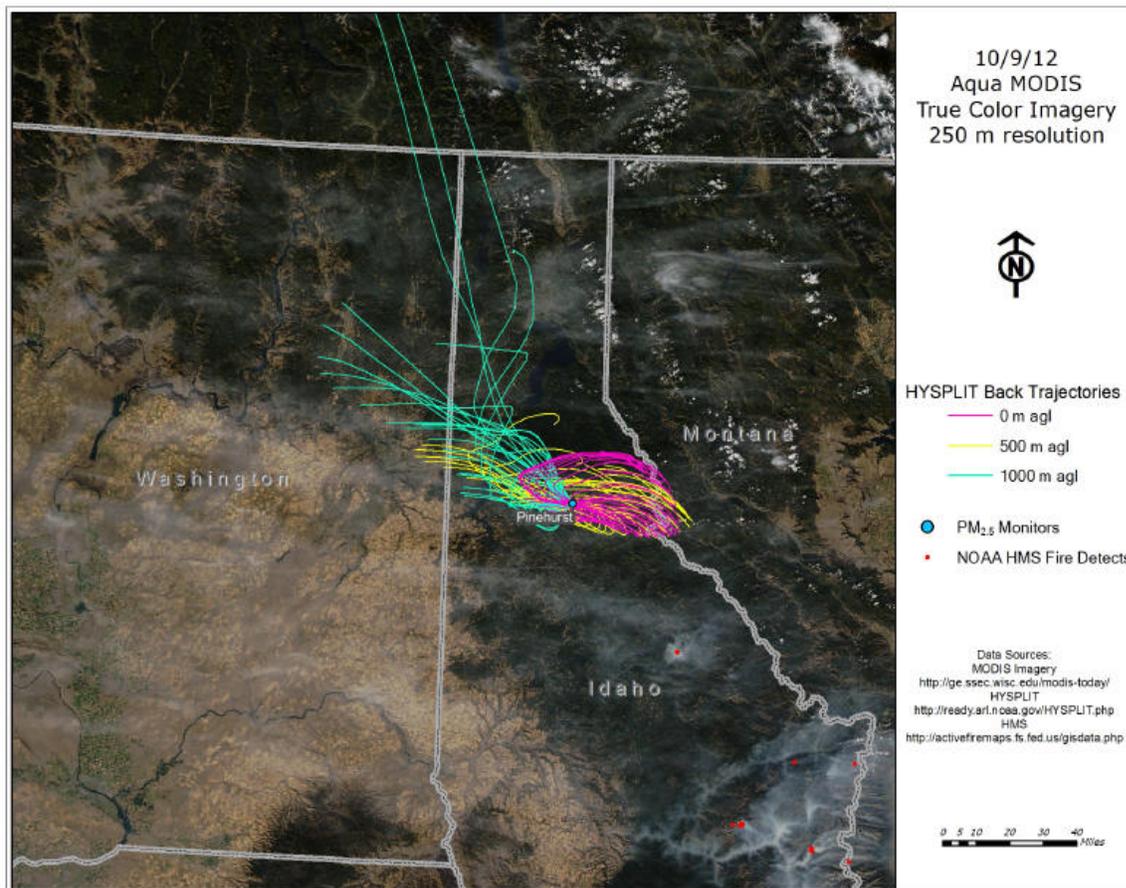
Summary of EER Evidence for Pinehurst Monitor Value, 26.6 $\mu\text{g}/\text{m}^3$ on 10-8-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; >90 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1 (See Sec. 4)
	Weather Conditions:	Rex block shifts to the north bringing weak divergence zone over eastern WA/OR with a stronger zonal component to transport winds in northern Idaho.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows light smoke in eastern WA and northern ID with clouds to the east of Pinehurst. Back trajectories intersect smoke and/or fire detects from the St. Mary's Mission Road and Wenatchee (WA) fires. Hourly PM _{2.5} trace exhibits a common diurnal pattern (high early and late, lower midday) during the home heating season in Pinehurst. However, levels are around the 95 th percentile hourly values for October and multiple spikes are superimposed, suggesting an addition of smoke to the mix.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. No CRB in Kootenai, Shoshone or Benewah Co. See Sec. 4.10.5 and 4.11.5.
	Speciation:	IMPROVE data show carbon PM _{2.5} was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 11.6 to 19.6 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	DEQ daily AQI forecast.

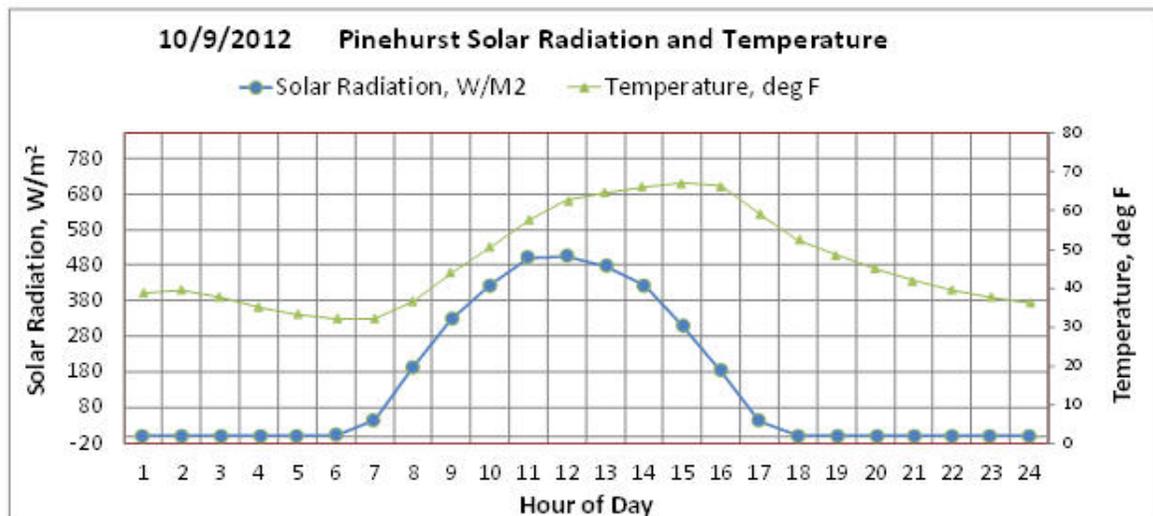
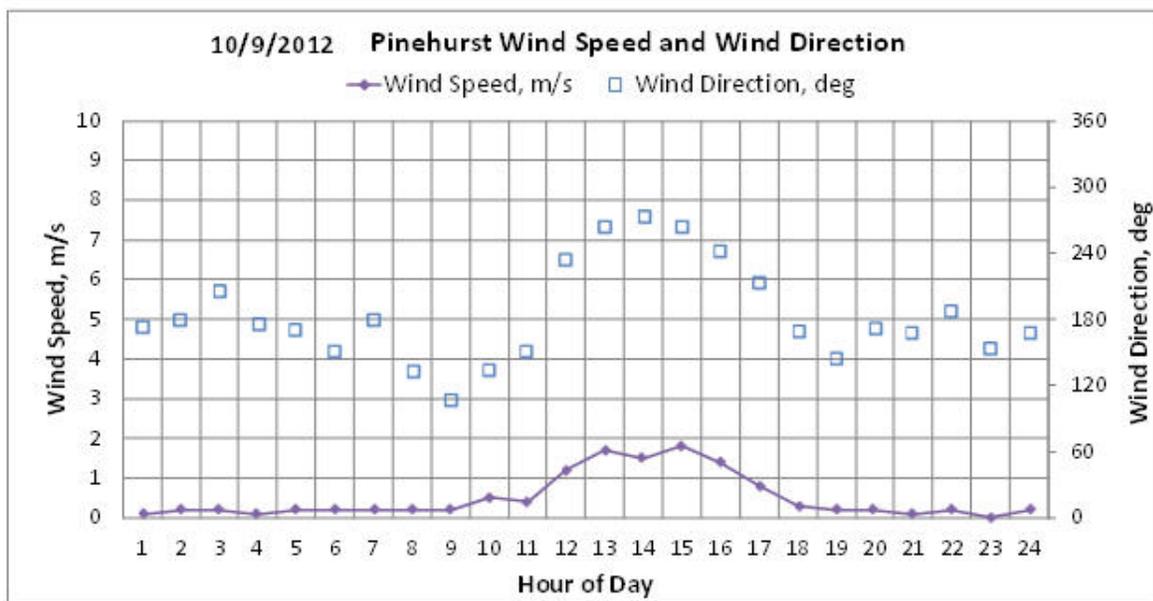
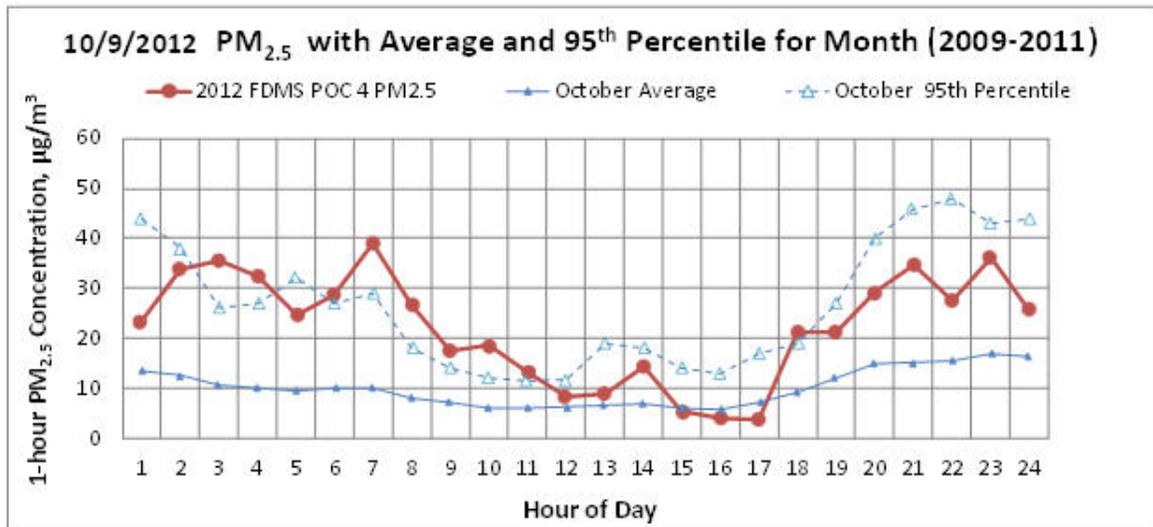




October 9, 2012

Summary of EER Evidence for Pinehurst Monitor Value, 22.2 $\mu\text{g}/\text{m}^3$ on 10-9-2012, AQS #16-079-0017 POC 4		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; >85 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 2 (See Sec. 4)
	Weather Conditions:	Low separates from jet stream and retrogrades over Pacific ocean bringing strong northerly component to transport winds to ID as ridge amplifies over Gulf of Alaska.
	Transport Conditions and $\text{PM}_{2.5}$ /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows light smoke in eastern WA and northern ID mixed with cirrus. Back trajectories intersect no fire detects and switch back and forth across the Panhandle. Low travel distances indicate stagnation. Hourly $\text{PM}_{2.5}$ trace exhibits a common diurnal pattern (high early and late, lower midday) during the home heating season in Pinehurst. However, the morning concentrations are elevated above previous years' 95 th percentile values, suggesting an additional emission source.
	Alternative Hypotheses:	Point sources very small-see Sec. 4.3.7 in this addendum. No CRB in Kootenai, Shoshone or Benewah Co. See Sec. 4.10.5 and 4.11.5.
	Speciation:	IMPROVE data show carbon $\text{PM}_{2.5}$ was higher in region from Aug thru Sept (p.23).
AAQ	See discussion, Sec 5.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NE/HAURL	See discussion, Sec 6.	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criteria is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 7 to 15 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 7.2 to 15.2 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix E	<u>Daily AQI forecast.</u>





Appendix D. Alternative Sources

D-2. Prescribed fire database entries from the Montana/Idaho Airshed Group database for Idaho, July 1 through October 12 (accessed 3/14/2014).

No burns occurred prior to 9/26/2012.

Date	Burn Type	Burned Acres	Latitude	Longitude	Distance and Direction from Pinehurst
9/26/2012	Broadcast	80	42.644	-114.912	547 km south
9/26/2012	Broadcast	120	42.598	-115.022	550 km south
10/11/2012	Broadcast	10	47.868	-116.968	67 km northwest
10/11/2012	Broadcast	46	47.868	-116.968	67 km northwest
10/12/2012	Broadcast	80	42.644	-114.912	547 km south

D-3. Prescribed fire database entries from the Montana/Idaho Airshed Group database for Western Montana, July 1 through October 12 (accessed 3/14/2014).

No burns occurred prior to 10/10/2012.

Date	Burn Type	Burned Acres	Latitude	Longitude	Distance and Direction from Pinehurst
10/10/2012	Understory	15	48.667	-115.380	143 km northeast
10/10/2012	Understory	2	48.607	-115.295	140 km northeast
10/12/2012	Understory	10	48.667	-115.380	143 km northeast

Appendix E. Mitigation—Stage 1 Forecast and Cautions, Daily Monitor Summary and Press Releases

Appendix E-1. Dates of Stage 1 Forecast and Caution was in effect, with example Stage 1 notices.

Table 14. Dates during 2012 Wildfire period when Stage 1 Forecast and Caution was in effect, imposing a ban on all forms of open burning.

Date	Stage 1 Forecast and Caution, Lemhi County	Stage 1 Forecast and Caution, Shoshone County
10/2/2012		
10/5/2012		
10/7/2012		