

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
Department of Environmental Quality**

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Executive Summary

On December 6, 2013, 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* (Request) 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 assured that the Salmon design value (2010 – 2012) with respect to the Annual National Ambient Air Quality Standard for PM_{2.5} is below 12.0 µg/m³. On January 30, 2014, EPA requested DEQ submit additional information for at least August 8, 9, 21, 22, and September 8 and 24, 2012 for Salmon, ID. The 2012 wildfire season can be treated as a single event occurring of many consecutive days. Therefore, DEQ has reviewed all the days during the 2012 wildfire season for Salmon and is including all days that meet the requirements for exceptional events.

This addendum includes additions for 20 new monitoring days. The following tables in the original submittal should be replaced by the corresponding tables in this addendum. The new information in the tables is shaded. Section 4.3.6 Industrial Sources should be added to the original submittal and is applicable to all days included in the original submittal as well as the days included in this addendum. The information included in Appendix B in this addendum should be added to Appendix B in the original submittal. The remainder of the original submittal remains unchanged.

- Table A: 20 additional days are included in this table showing the monitor values for which DEQ is requesting EPA concurrence.
- Table 6: 20 additional days are included in this table showing the percentile rankings for Salmon PM_{2.5} monitor values.
- Table 10: 20 additional days are included in this table showing the estimated contribution of Salmon values that would not have occurred “But For” the 2012 wildfires.
- Section 4.3.6 Industrial Sources: This is a new sub-section added to Section 4.3 Alternative Hypothesis discussing PM_{2.5} emissions from industrial sources in and around Salmon.
- Appendix A-1: 20 additional days are included in this table that shows the Salmon monitor values and whether they were included in the original submittal or this addendum.
- Appendix D-2: Added distance and direction from Salmon for the prescribed burns in Idaho. Accessed the MT/ID Airshed Group database again to verify burns from July 1 through October 12.
- Appendix D-3: Added distance and direction from Salmon for the prescribed burns in Montana. Accessed the MT/ID Airshed Group database again to verify burns from July 1

through October 12. An additional burn had been updated in the database since the original submittal. This burn has been added to the table.

- Appendix E-1, Table 14: Added 7 days to this table that shows whether a Stage 1 Forecast and Caution was in effect for Salmon and Pinehurst. Thirteen days included in this addendum were already included in Table 14 of the original submittal.
- Appendix B, Salmon EER Daily Summaries: Added two page summaries for the 20 days included in this addendum.

Section 4.3.6 Industrial Sources

There are very few permitted industrial sources located in Lemhi County. The table below summarizes the permitted industrial facilities that were operational during the 2012 wildfire season (July – October). With the exception of the rock crushers, these facilities operate year-round on a consistent basis. The rock crushers have operated in Salmon in previous years. The six industrial facilities in the immediate Salmon area are minor sources of PM_{2.5} and their emissions are reflected in the normal historical fluctuations presented in Section 3.1. Therefore, there was no unusual industrial source activity during the 2012 wildfire season.

Type and Number of Facilities	Location	Type of Emissions
Three mining operations	Closest is 12 miles from Salmon	Mainly fugitive dust (coarse particulate matter)
Two automotive coating facilities	Salmon	Volatile Organic Carbon (VOC) and very little PM _{2.5}
One Power substation	Salmon	Less than 5 tons/year of PM ₁₀
One laminated beam plant	Salmon	Less than 45 tons/year of PM ₁₀
Two rock crushers	Salmon	Mainly fugitive dust (coarse particulate matter)

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

Salmon, Lemhi County Idaho Monitor Site AQS 16-059-0004		
Date	POC	Daily Mean PM_{2.5} Concentration, µg/m³
Primary, BAM 1020 Monitor Values		
7/30/2012	3	15.1
7/31/2012	3	15.4
8/5/2012	3	16.3
8/6/2012	3	19.7
8/7/2012	3	20.5
8/8/2012	3	25.1
8/9/2012	3	27
8/10/2012	3	33.7
8/11/2012	3	37.2
8/12/2012	3	49.2
8/13/2012	3	96.5
8/14/2012	3	147
8/15/2012	3	67.3
8/16/2012	3	106.5
8/17/2012	3	96.6
8/18/2012	3	30.4
8/19/2012	3	34.5
8/20/2012	3	37.7
8/21/2012	3	22.2
8/22/2012	3	21.8
8/23/2012	3	35.9
8/24/2012	3	108.2
8/25/2012	3	91.3
8/26/2012	3	45.5
8/28/2012	3	58.2
8/29/2012	3	78.1
8/30/2012	3	132
8/31/2012	3	49.8
9/1/2012	3	69.4
9/2/2012	3	145.2
9/3/2012	3	186.9
9/4/2012	3	182.7
9/5/2012	3	97.8
9/6/2012	3	48.4
9/7/2012	3	53.1
9/8/2012	3	27.5
9/10/2012	3	136.4
9/11/2012	3	214.3
9/12/2012	3	194.4
9/13/2012	3	153.7
9/14/2012	3	70.2
9/15/2012	3	162.1
9/16/2012	3	162.5

Salmon, Lemhi County Idaho Monitor Site AQS 16-059-0004		
Date	POC	Daily Mean PM_{2.5} Concentration, µg/m³
Co-located, FRM Monitor Values		
8/13/2012	1	85
8/19/2012	1	31.2
8/25/2012	1	77.8
8/31/2012	1	45.1
10/12/2012	1	14.3

Pinehurst, Shoshone County Idaho Monitor Site AQS 16-079-0017		
Primary, FDMS Monitor Values		
9/14/2012	4	31.3
9/15/2012	4	43.6
9/22/2012	4	20.8
9/25/2012	4	18.4

(No co-located monitor values on these 4 days)

Salmon, Lemhi County Idaho		
Monitor Site AQS 16-059-0004		
Date	POC	Daily Mean PM_{2.5} Concentration, µg/m³
Primary, BAM 1020 Monitor Values		
9/17/2012	3	112.3
9/18/2012	3	130.3
9/19/2012	3	135.5
9/20/2012	3	159.8
9/21/2012	3	153.5
9/22/2012	3	86.6
9/23/2012	3	44.3
9/24/2012	3	31.8
9/25/2012	3	62.7
9/26/2012	3	37.4
9/27/2012	3	39.3
9/28/2012	3	20
10/1/2012	3	18.2
10/3/2012	3	14.6
10/5/2012	3	13.5
10/8/2012	3	22.8
10/9/2012	3	33.2
10/10/2012	3	24.2
10/11/2012	3	26.3
10/12/2012	3	17.1

Table 6. Percentile rankings for Salmon PM_{2.5} monitor values (99% indicates 99% or above).

Date	2012 PM _{2.5} (µg/m ³)	Percentile (Fire Season)	Percentile (Annual)
7/30/2012	15.1	93%	82%
7/31/2012	15.4	95%	82%
8/5/2012	16.3	96%	84%
8/6/2012	19.7	97%	88%
8/7/2012	20.5	97%	88%
8/8/2012	25.1	99%	92%
8/9/2012	27	99%	93%
8/10/2012	33.7	99%	97%
8/11/2012	37.2	99%	98%
8/12/2012	49.2	99%	99%
8/13/2012	96.5	99%	99%
8/14/2012	147	99%	99%
8/15/2012	67.3	99%	99%
8/16/2012	106.5	99%	99%
8/17/2012	96.6	99%	99%
8/18/2012	30.4	99%	95%
8/19/2012	34.5	99%	97%
8/20/2012	37.7	99%	98%
8/21/2012	22.2	98%	90%
8/22/2012	21.8	98%	89%
8/23/2012	35.9	99%	98%
8/24/2012	108.2	99%	99%
8/25/2012	91.3	99%	99%
8/26/2012	45.5	99%	99%
8/28/2012	58.2	99%	99%
8/29/2012	78.1	99%	99%
8/30/2012	132	99%	99%
8/31/2012	49.8	99%	99%
9/1/2012	69.4	99%	99%
9/2/2012	145.2	99%	99%
9/3/2012	186.9	99%	99%
9/4/2012	182.7	99%	99%
9/5/2012	97.8	99%	99%
9/6/2012	48.4	99%	99%
9/7/2012	53.1	99%	99%
9/8/2012	27.5	99%	94%
9/10/2012	136.4	99%	99%
9/11/2012	214.3	99%	99%

Date	2012 PM_{2.5} (µg/m³)	Percentile (Fire Season)	Percentile (Annual)
9/12/2012	194.4	99%	99%
9/13/2012	153.7	99%	99%
9/14/2012	70.2	99%	99%
9/15/2012	162.1	99%	99%
9/16/2012	162.5	99%	99%
9/17/2012	112.3	99%	99%
9/18/2012	130.3	99%	99%
9/19/2012	135.5	99%	99%
9/20/2012	159.8	99%	99%
9/21/2012	153.5	99%	99%
9/22/2012	86.6	99%	99%
9/23/2012	44.3	99%	99%
9/24/2012	31.8	99%	96%
9/25/2012	62.7	99%	99%
9/26/2012	37.4	99%	98%
9/27/2012	39.3	99%	98%
9/28/2012	20	97%	88%
10/1/2012	18.2	97%	86%
10/3/2012	14.6	93%	80%
10/5/2012	13.5	93%	77%
10/8/2012	22.8	98%	90%
10/9/2012	33.2	99%	96%
10/10/2012	24.2	99%	91%
10/11/2012	26.3	99%	93%
10/12/2012	17.1	97%	85%

Table 10. Estimated contribution of Salmon values that would not have occurred "But For" the 2012 wildfires. The two right-hand columns represent the range of concentration contributed by wildfires. A zero in the third column indicates the monitored value is less than or equal to the 95th percentile value (15.9 $\mu\text{g}/\text{m}^3$).

Date	PM _{2.5} Value at Monitor ($\mu\text{g}/\text{m}^3$)	Value–95th Percentile ($\mu\text{g}/\text{m}^3$)	Value–Average ($\mu\text{g}/\text{m}^3$)
7/30/2012	15.1	0	9.3
7/31/2012	15.4	0	9.6
8/5/2012	16.3	0.4	10.5
8/6/2012	19.7	3.8	13.9
8/7/2012	20.5	4.6	14.7
8/8/2012	25.1	9.2	19.3
8/9/2012	27	11.1	21.2
8/10/2012	33.7	17.8	27.9
8/11/2012	37.2	21.3	31.4
8/12/2012	49.2	33.3	43.4
8/13/2012	96.5	80.6	90.7
8/14/2012	147	131.1	141.2
8/15/2012	67.3	51.4	61.5
8/16/2012	106.5	90.6	100.7
8/17/2012	96.6	80.7	90.8
8/18/2012	30.4	14.5	24.6
8/19/2012	34.5	18.6	28.7
8/20/2012	37.7	21.8	31.9
8/21/2012	22.2	6.3	16.4
8/22/2012	21.8	5.9	16.0
8/23/2012	35.9	20.0	30.1
8/24/2012	108.2	92.3	102.4
8/25/2012	91.3	75.4	85.5
8/26/2012	45.5	29.6	39.7
8/28/2012	58.2	42.3	52.4
8/29/2012	78.1	62.2	72.3
8/30/2012	132	116.1	126.2
8/31/2012	49.8	33.9	44.0
9/1/2012	69.4	53.5	63.6
9/2/2012	145.2	129.3	139.4
9/3/2012	186.9	171.0	181.1
9/4/2012	182.7	166.8	176.9
9/5/2012	97.8	81.9	92.0
9/6/2012	48.4	32.5	42.6
9/7/2012	53.1	37.2	47.3
9/8/2012	27.5	11.6	21.7
9/10/2012	136.4	120.5	130.6

Date	PM _{2.5} Value at Monitor (µg/m ³)	Value–95th Percentile (µg/m ³)	Value–Average (µg/m ³)
9/11/2012	214.3	198.4	208.5
9/12/2012	194.4	178.5	188.6
9/13/2012	153.7	137.8	147.9
9/14/2012	70.2	54.3	64.4
9/15/2012	162.1	146.2	156.3
9/16/2012	162.5	146.6	156.7
9/17/2012	112.3	96.4	106.5
9/18/2012	130.3	114.4	124.5
9/19/2012	135.5	119.6	129.7
9/20/2012	159.8	143.9	154.0
9/21/2012	153.5	137.6	147.7
9/22/2012	86.6	70.7	80.8
9/23/2012	44.3	28.4	38.5
9/24/2012	31.8	15.9	26.0
9/25/2012	62.7	46.8	56.9
9/26/2012	37.4	21.5	31.6
9/27/2012	39.3	23.4	33.5
9/28/2012	20	4.1	14.2
10/1/2012	18.2	2.3	12.4
10/3/2012	14.6	0	8.8
10/5/2012	13.5	0	7.7
10/8/2012	22.8	6.9	17.0
10/9/2012	33.2	17.3	27.4
10/10/2012	24.2	8.3	18.4
10/11/2012	26.3	10.4	20.5
10/12/2012	17.1	1.2	11.3

Appendix A Monitor Values

Appendix A-1 Salmon Monitor Values for all Days AQS16-059-0004.

Date	Salmon POC 3 (Primary) PM _{2.5}	Salmon POC 1 (Co-located) PM _{2.5}	Values Included in Dec 6, 2013 Request	Values Included in this Addendum
7/30/2012	15.1			Yes
7/31/2012	15.4			Yes
8/5/2012	16.3			Yes
8/6/2012	19.7			Yes
8/7/2012	20.5			Yes
8/8/2012	25.1			Yes
8/9/2012	27			Yes
8/10/2012	33.7		Yes	
8/11/2012	37.2		Yes	
8/12/2012	49.2		Yes	
8/13/2012	96.5	85	Yes	
8/14/2012	147		Yes	
8/15/2012	67.3		Yes	
8/16/2012	106.5		Yes	
8/17/2012	96.6		Yes	
8/18/2012	30.4		Yes	
8/19/2012	34.5	31.2	Yes	
8/20/2012	37.7		Yes	
8/21/2012	22.2			Yes
8/22/2012	21.8			Yes
8/23/2012	35.9		Yes	
8/24/2012	108.2		Yes	
8/25/2012	91.3	77.8	Yes	
8/26/2012	45.5		Yes	
8/27/2012	7.9			
8/28/2012	58.2		Yes	
8/29/2012	78.1		Yes	
8/30/2012	132		Yes	
8/31/2012	49.8		Yes	
9/1/2012	69.4		Yes	
9/2/2012	145.2		Yes	
9/3/2012	186.9		Yes	
9/4/2012	182.7		Yes	
9/5/2012	97.8		Yes	
9/6/2012	48.4		Yes	
9/7/2012	53.1		Yes	
9/8/2012	27.5			Yes
9/9/2012	11.5			
9/10/2012	136.4		Yes	
9/11/2012	214.3		Yes	

Date	Salmon POC 3 (Primary) PM_{2.5}	Salmon POC 1 (Co-located) PM_{2.5}	Values Included in Dec 6, 2013 Request	Values Included in this Addendum
9/12/2012	194.4		Yes	
9/13/2012	153.7		Yes	
9/14/2012	70.2		Yes	
9/15/2012	162.1		Yes	
9/16/2012	162.5		Yes	
9/17/2012	112.3		Yes	
9/18/2012	130.3		Yes	
9/19/2012	135.5		Yes	
9/20/2012	159.8		Yes	
9/21/2012	153.5		Yes	
9/22/2012	86.6		Yes	
9/23/2012	44.3		Yes	
9/24/2012	31.8			Yes
9/25/2012	62.7		Yes	
9/26/2012	37.4		Yes	
9/27/2012	39.3		Yes	
9/28/2012	20			Yes
9/29/2012	7			
9/30/2012	14.5	12.1		
10/1/2012	18.2			Yes
10/3/2012	14.6			Yes
10/5/2012	13.5			Yes
10/8/2012	22.8			Yes
10/9/2012	33.2			Yes
10/10/2012	24.2			Yes
10/11/2012	26.3			Yes
10/12/2012	17.1			Yes

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

No burns occurred prior to 9/26/12. The two burns on 9/26 occurred in south-central Idaho over 150 miles from Salmon.

Date	Burn Type	Burned Acres	Latitude	Longitude	Distance and Direction from Salmon
9/26/2012	Broadcast	80	42.64400101	-114.9120026	180 miles SW
9/26/2012	Broadcast	120	42.59780121	-115.0220032	185 miles SW
10/4/2012	Broadcast	200	43.25	-111.4209976	180 miles SE
10/5/2012	Broadcast	400	43.25	-111.4209976	180 miles SE
10/11/2012	Broadcast	10	47.86759949	-116.9680023	235 miles NW
10/11/2012	Broadcast	46	47.86759949	-116.9680023	235 miles NW
10/12/2012	Broadcast	80	42.64400101	-114.9120026	180 miles SW

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

No burns occurred prior to Oct 10.

Date	Burn Type	Burned Acres	Latitude	Longitude	Distance and Direction from Salmon
10/10/2012	Understory	15	48.66699982	-115.3799973	250 miles NW
10/10/2012	Understory	2	48.6069984436	-115.29499816895	245 miles NW
10/12/2012	Understory	10	48.66699982	-115.3799973	250 miles NW

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	Date	Stage 1 Forecast and Caution, Lemhi County	Stage 1 Forecast and Caution, Shoshone County
7/30/2012			9/1/2012	In Effect	
7/31/2012			9/2/2012	In Effect	
8/5/2012			9/3/2012	In Effect	
8/6/2012			9/4/2012	In Effect	
8/7/2012			9/5/2012	In Effect	
8/8/2012			9/6/2012	In Effect	
8/9/2012			9/7/2012	In Effect	
8/10/2012			9/8/2012	In Effect	
8/11/2012			9/9/2012	In Effect	
8/12/2012			9/10/2012	In Effect	
8/13/2012	In Effect		9/11/2012	In Effect	
8/14/2012	In Effect		9/12/2012	In Effect	
8/15/2012	In Effect		9/13/2012	In Effect	
8/16/2012	In Effect		9/14/2012	In Effect	In Effect
8/17/2012	In Effect		9/15/2012	In Effect	In Effect
8/18/2012	In Effect		9/16/2012	In Effect	In Effect
8/19/2012	In Effect		9/17/2012	In Effect	
8/20/2012	In Effect		9/18/2012	In Effect	
8/21/2012	In Effect		9/19/2012	In Effect	
8/22/2012	In Effect		9/20/2012	In Effect	In Effect
8/23/2012	In Effect		9/21/2012	In Effect	In Effect
8/24/2012	In Effect		9/22/2012	In Effect	In Effect
8/25/2012	In Effect		9/23/2012	In Effect	In Effect
8/26/2012	In Effect		9/24/2012	In Effect	In Effect
8/27/2012	In Effect		9/25/2012	In Effect	In Effect
8/28/2012	In Effect		9/26/2012	In Effect	In Effect
8/29/2012	In Effect		9/27/2012	In Effect	In Effect
8/30/2012	In Effect		9/28/2012	In Effect	
8/31/2012	In Effect		9/29/2012	In Effect	
			9/30/2012	In Effect	
			10/1/2012	In Effect	
Additional days included in Addendum					
10/3/2012			10/9/2012		
10/5/2012			10/10/2012		
10/8/2012			10/11/2012		
			10/12/2012		

Appendix B: Salmon EER Information by Day - 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 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 m agl, 500 m agl, and 1000 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 Salmon are characterized for comparison.

Top chart: “Date” PM_{2.5} with Average and 95th Percentile for Month (2009-2011)

2012 PM_{2.5} – The orange 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 three years prior to 2012. 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 historical fluctuations for that hour and month.

Middle Chart: “Date” 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 met station on Highway 93 approximately 500 m south of US 28 in Salmon. The wind sensor is at 10 meters above ground level.

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

Bottom Chart: “Date” Solar Radiation, Temperature and Vert. Temp. Gradient

V. Temp Gradient, K/km – The open rust colored diamonds represent the vertical temperature gradient between the DEQ met station in Salmon at 3960 ft above sea level and the Kriley Creek RAWS met station located in the foothills north of Salmon at 5200 ft above sea level, downloaded from MESOWEST (Horel, 2002). Its location is show in Figure 17. The temperature gradient based on these two met stations is used to approximate a vertical temperature gradient- an indicator of atmospheric stability. A gradient greater than the environmental lapse rate, -6.5 K/km (degrees Kelvin per kilometer) is considered stable while a gradient lower than -6.5 K/km is considered unstable. This parameter can be used to identify days in which the surface temperature inversion does not break.

-dT/dZ = -6.5K/km – The black dotted line at -6.5 indicates the fixed environmental lapse rate, the vertical temperature gradient above which the atmosphere remains stable.

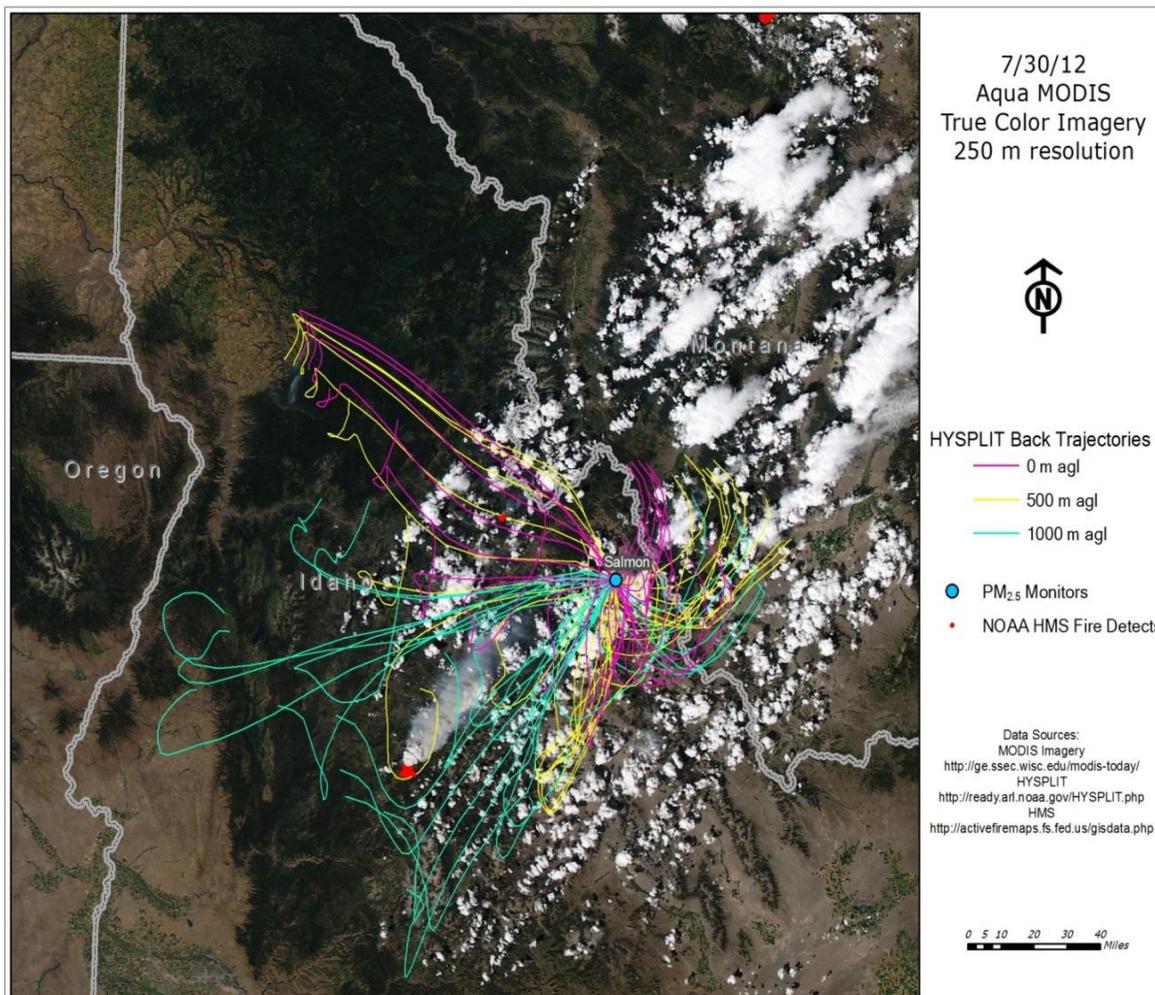
Temp. F – The green triangles and green line represent the temperature at 2 meters above ground as measured at the DEQ met station. It is included to indicate when the temperature dips below 40 degrees F, the point at which residential wood combustion is beginning to be used.

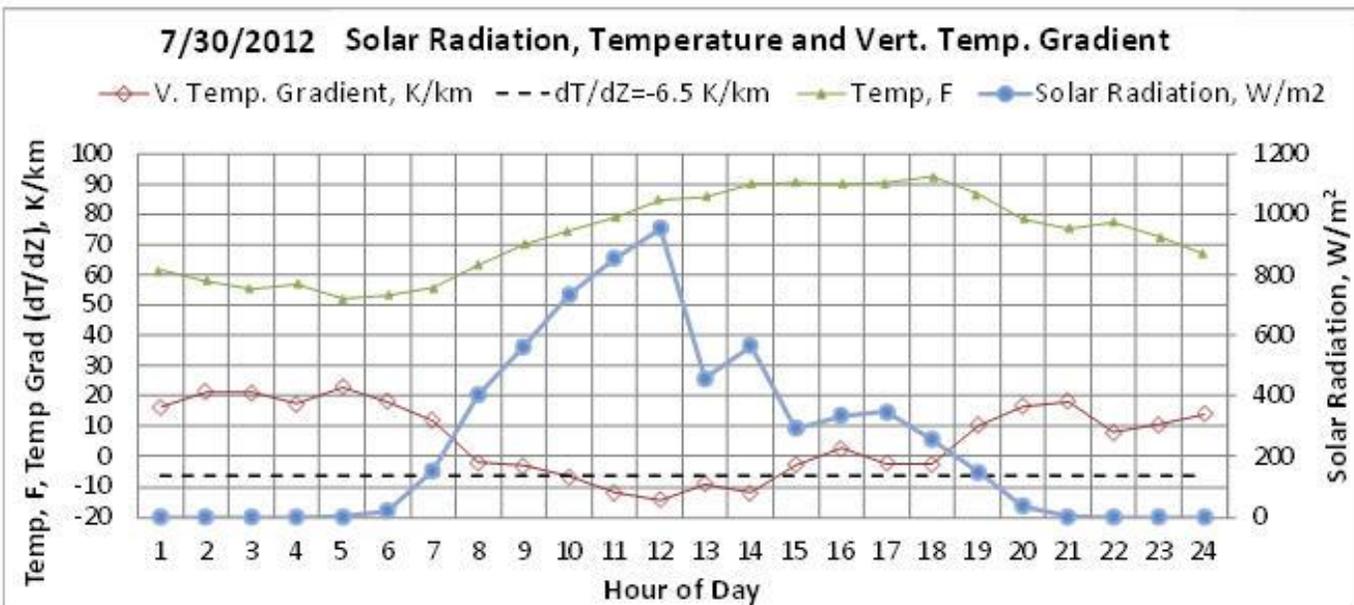
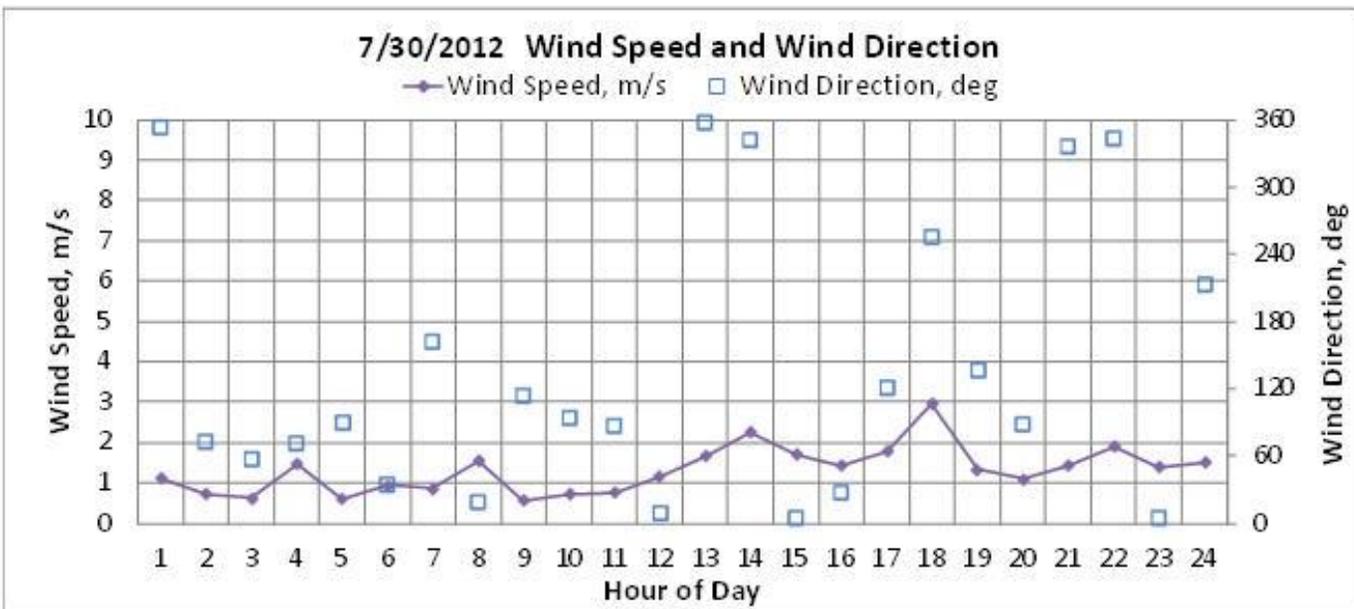
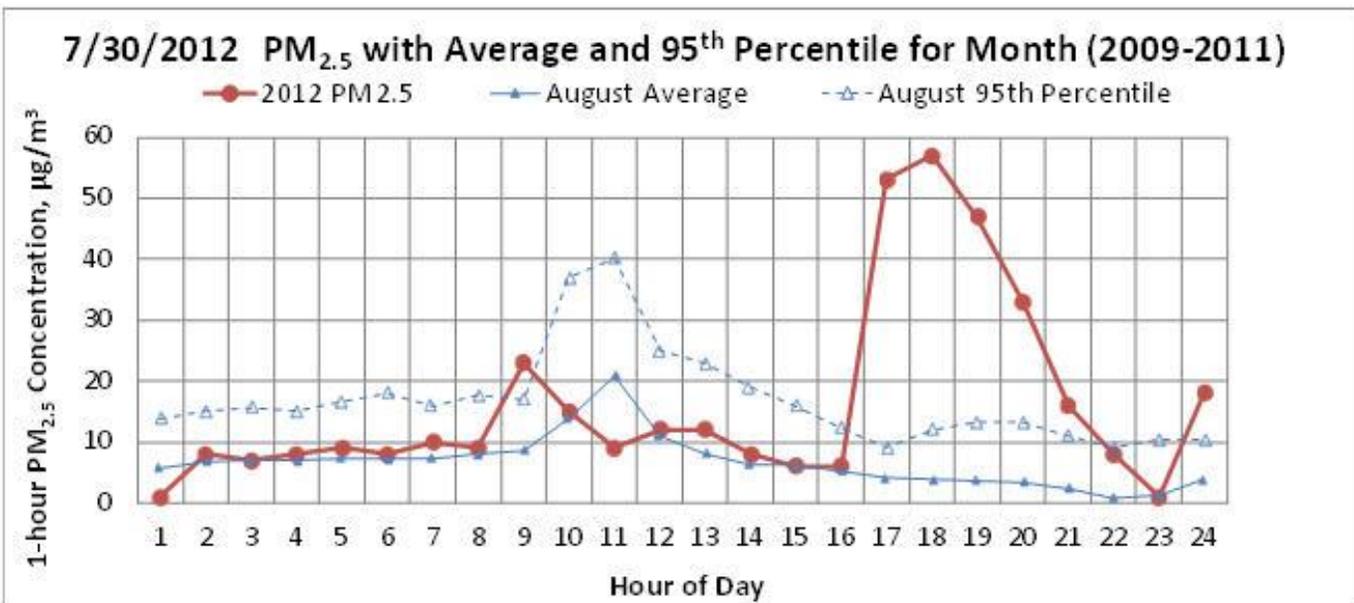
Solar Radiation, W/m² – the larger blue filled circles represent the solar radiation, in Watts per square meter (W/m²) measured at the DEQ met station. The solar intensity and cycle indicates when solar driven up-valley flows may be expected and when gravity driven down-slope and down-valley flows may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

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July 30, 2012

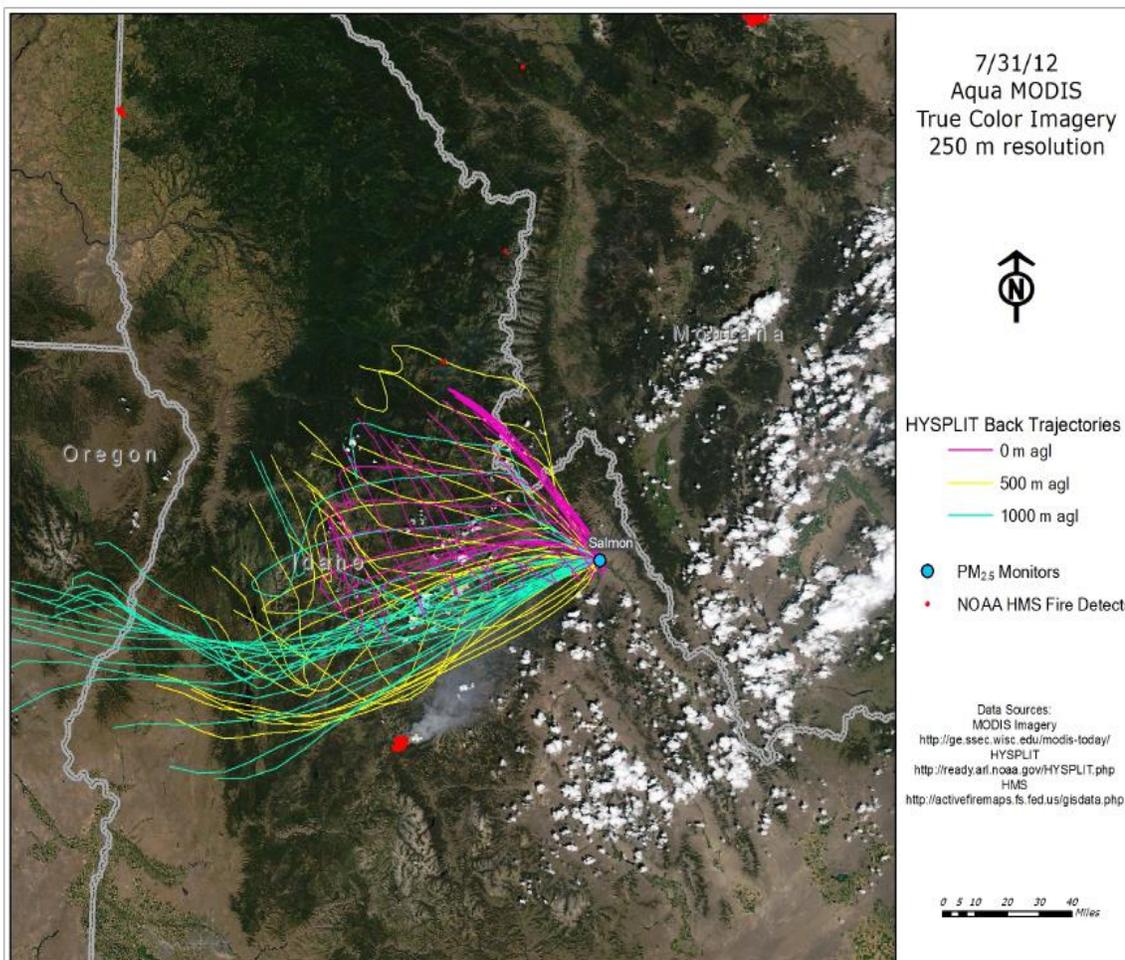
Summary of EER Evidence for Salmon Monitor Value, 15.1 µg/m ³ on 7-30-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	93 th percentile seasonally; 82 nd percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 4 (See Sec. 4), Halstead plume advects directly toward Salmon.
	Weather Conditions:	Ridge axis running northwest to southeast from northern Alberta to Colorado provides southwest winds at the 500mb level.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows large Halstead plume blowing northeast towards Salmon. Back trajectories intersect smoke from Halstead fire. Hourly trace spikes at 1700, with 2 hourly values more than 40 µg/m ³ higher than the 3-year 95 th percentile hourly values for August and 7 total hours above the hourly 95 th percentile.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temperature too warm for RWC. (See Sec. 4)
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated in region from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 µg/m ³ (Avg-to-95%tile), thus, this event contributed 0 to 9.3 µg/m ³ and we conclude that there may not have been concentrations above the Annual NAAQS "but for" this contribution. The 24-hour value is within 0.8 µg/m ³ of the 95 th percentile value.
Mitigation:	See Sec 8 and Appendix D	DEQ issued air quality forecast which included appropriate health messaging.

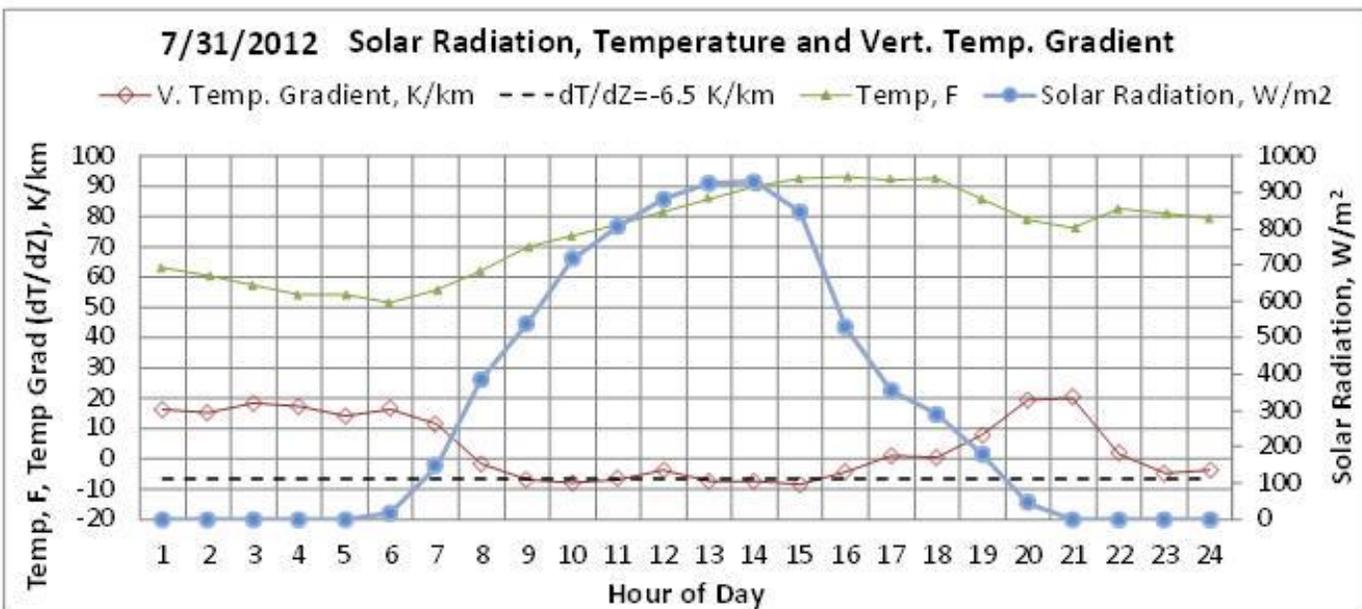
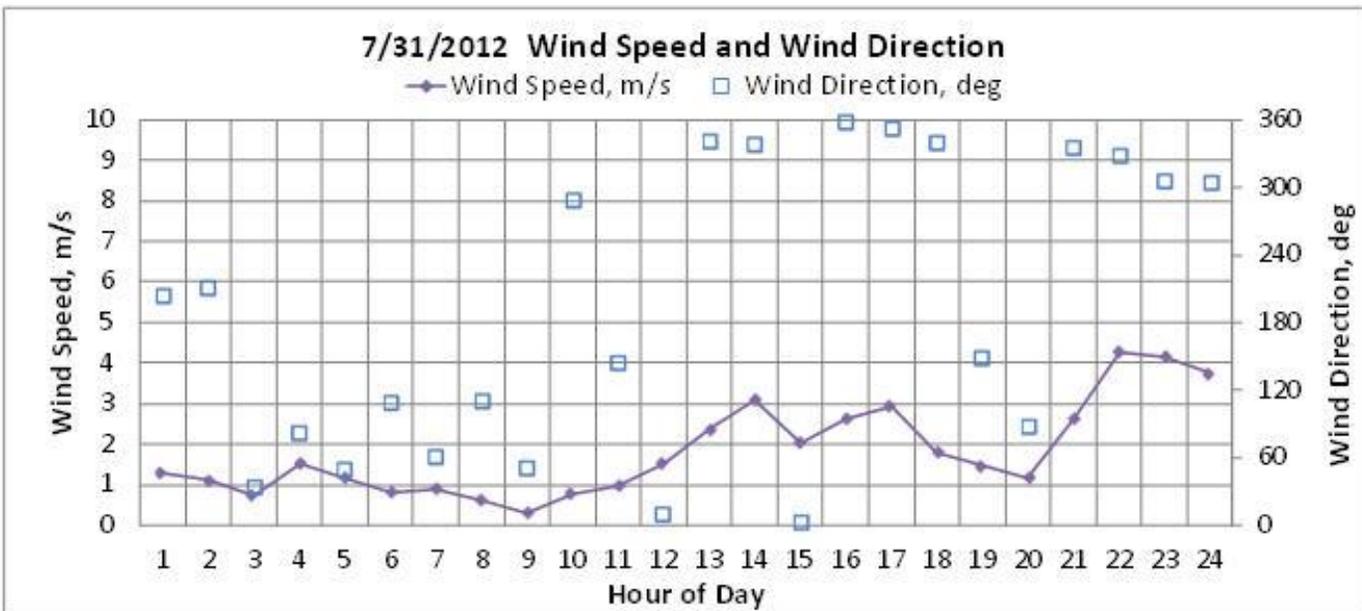
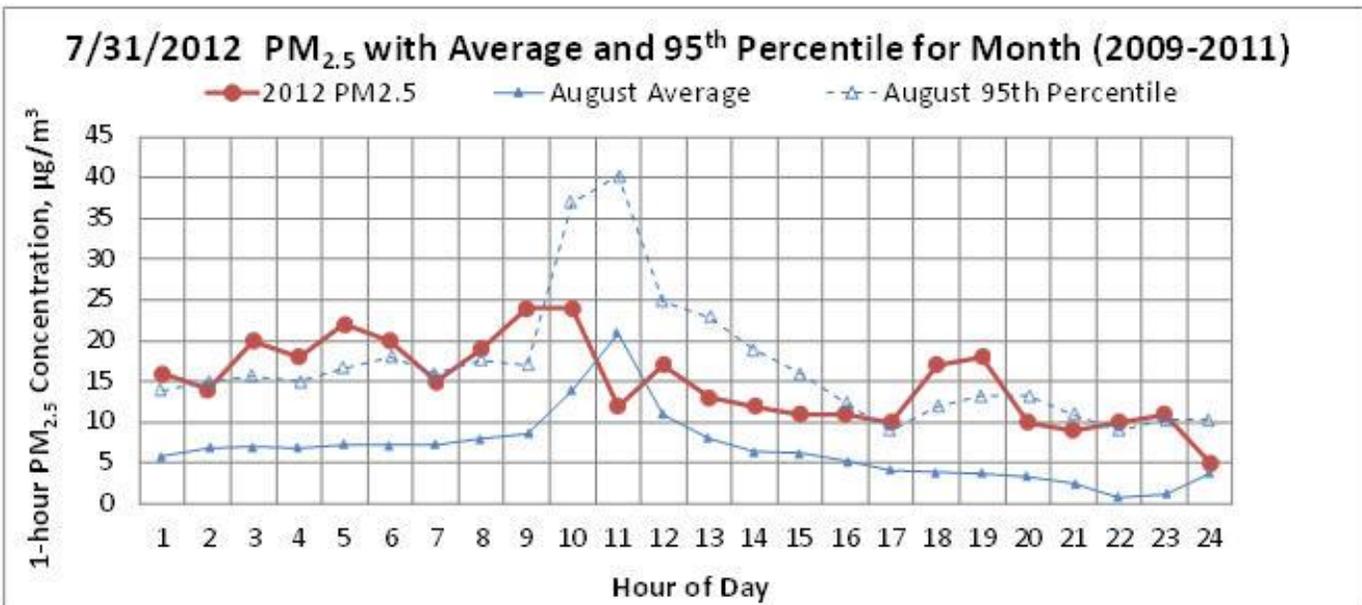




July 31, 2012

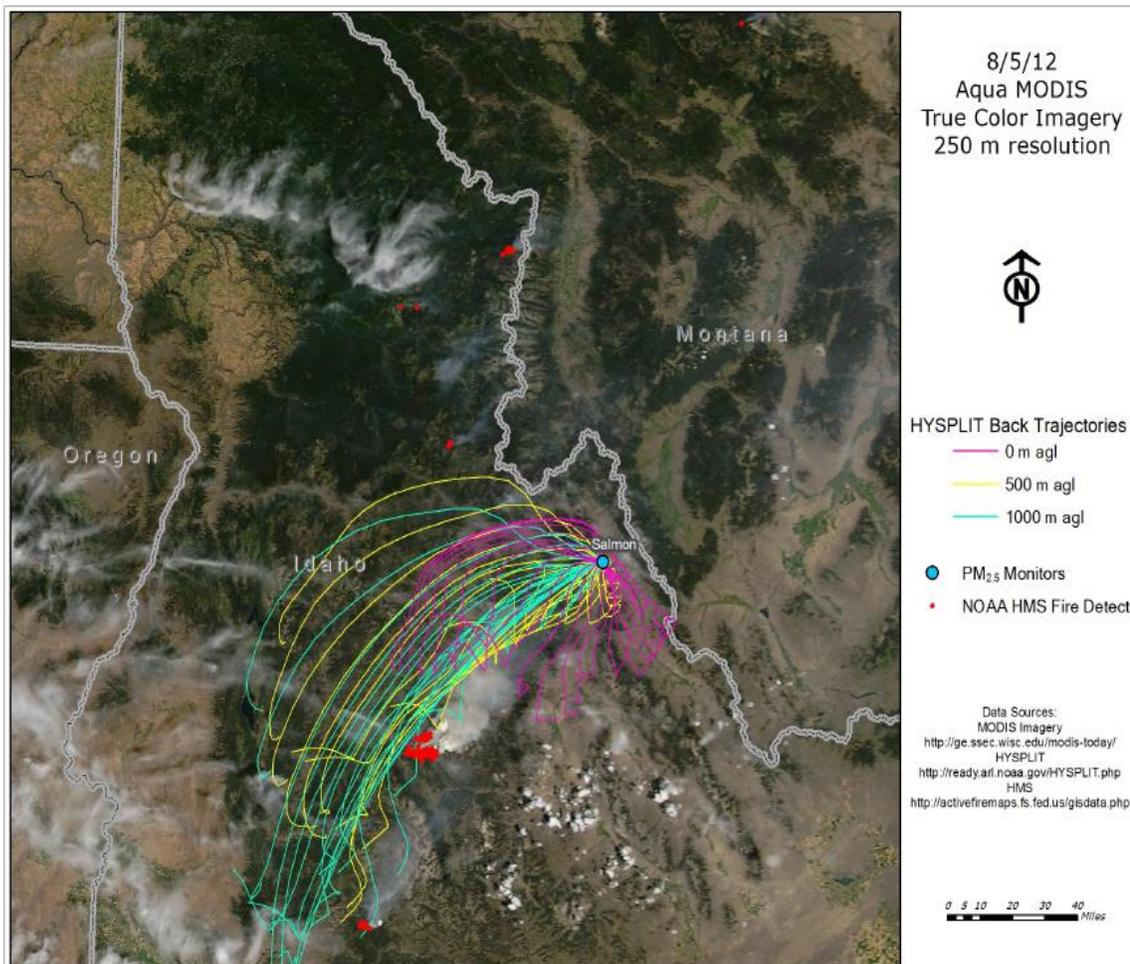
Summary of EER Evidence for Salmon Monitor Value, 15.4 µg/m ³ on 7-31-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	95 th percentile seasonally; 82 nd percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 4, Direct Halstead plume impact on Salmon (See Sec. 4)
	Weather Conditions:	Off shore low located near OR-WA border increases ridge amplitude and retrogrades ridge axis to run from N. ID (generating zonal flow over Idaho) to NM.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows large Halstead plume blowing northeast towards Salmon. Back trajectories intersect smoke from Halstead fire. Hourly trace is elevated above background for most of the day and at or over the 95 th percentile hourly values for August for a total of 12 hours.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temperature too warm for RWC. (See Sec. 4)
	Speciation:	IMPROVE data show carbon PM _{2.5} was higher in region from Aug thru Sept (p.)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 µg/m ³ (Avg-to-95 th tile), thus, this event contributed 0 to 9.6 µg/m ³ and we conclude that there may not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	DEQ issued air quality forecast which included appropriate health messaging.

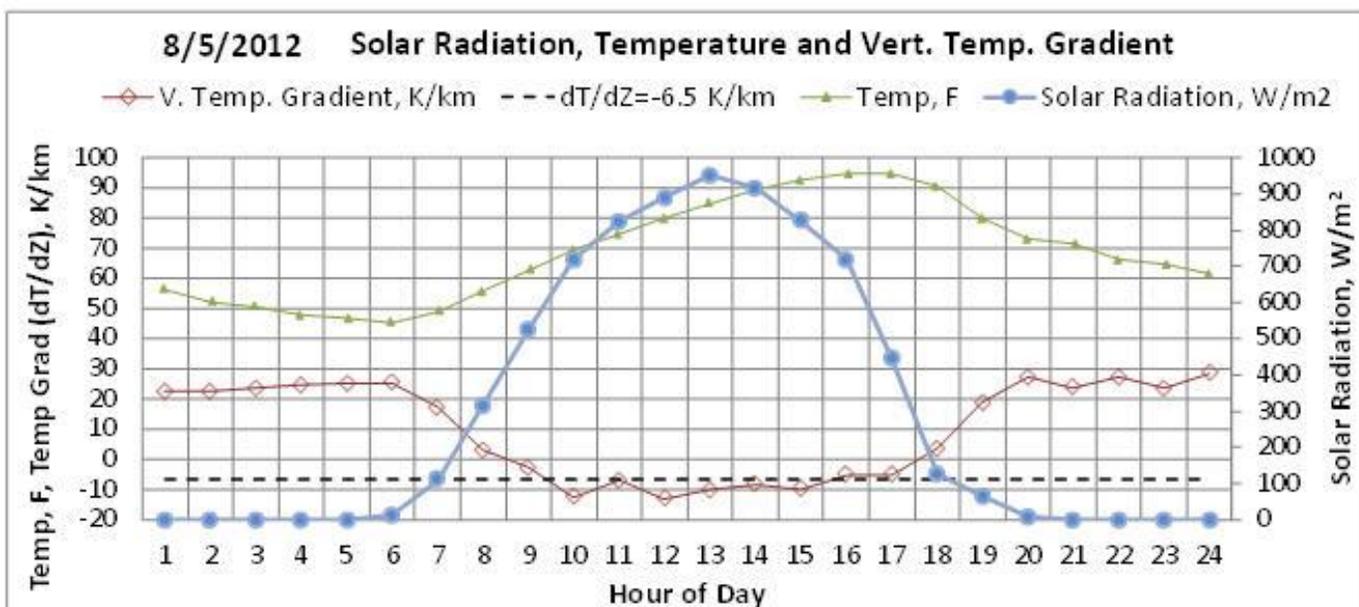
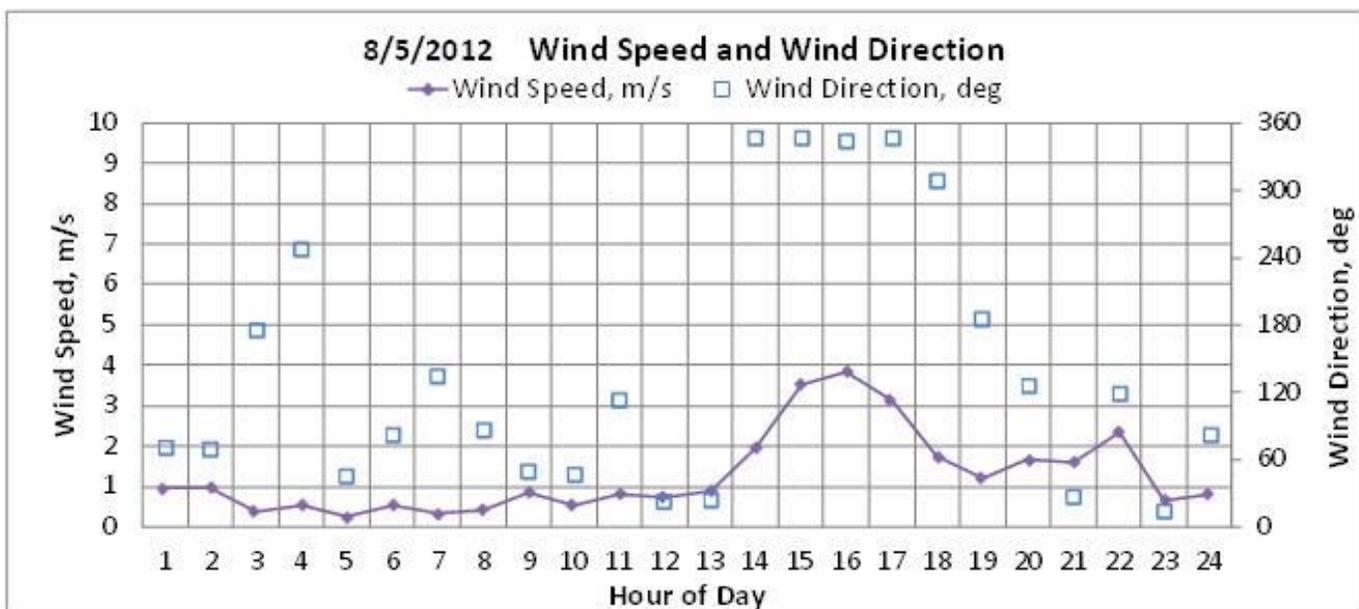
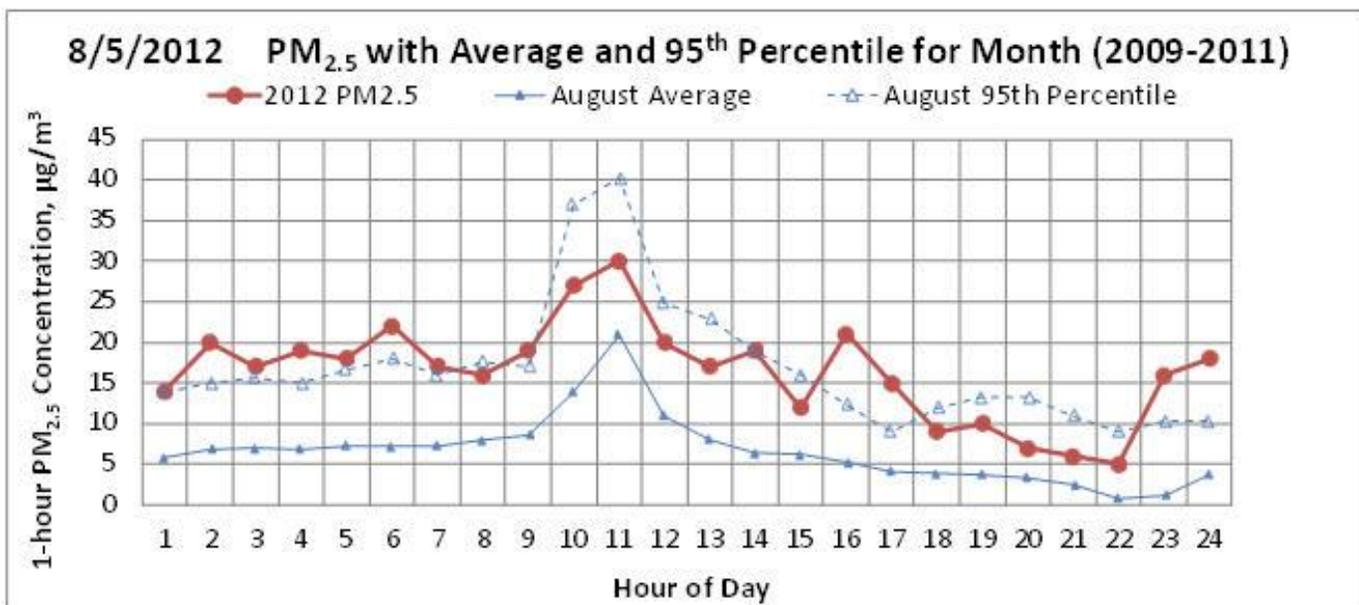




August 5, 2012

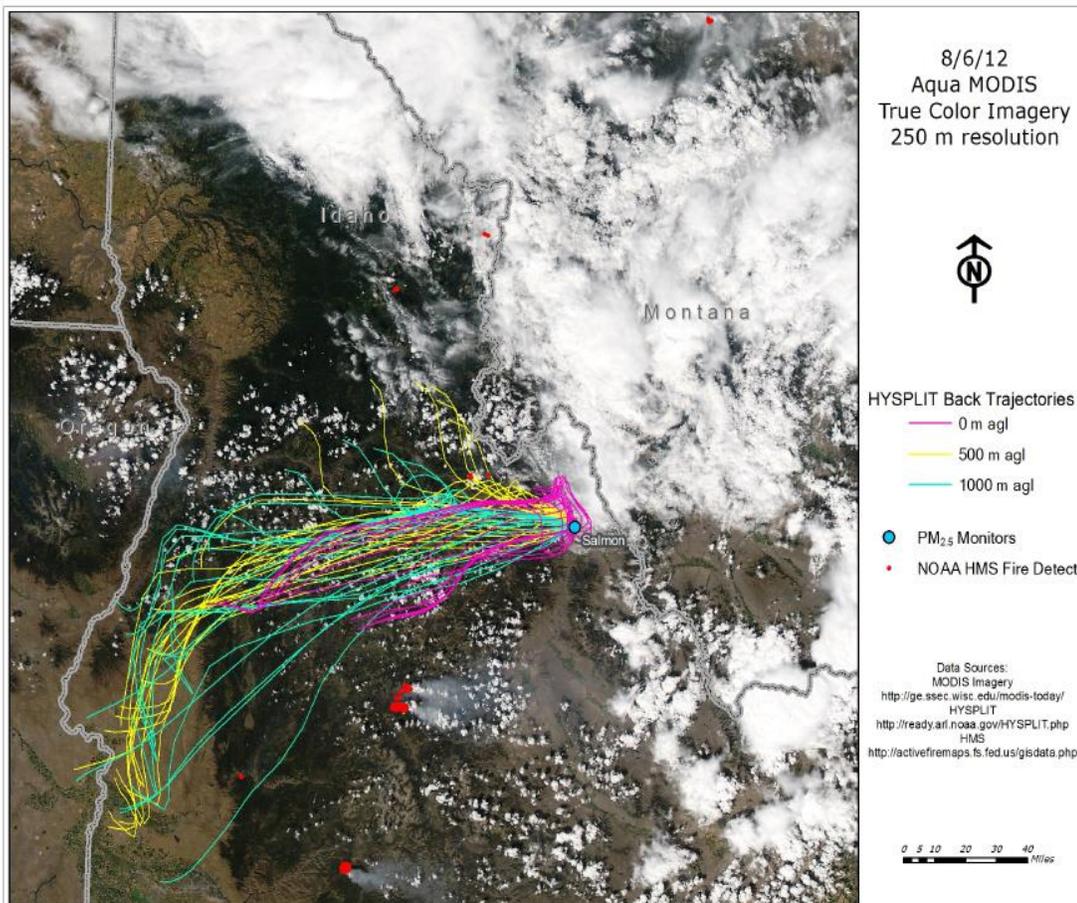
Summary of EER Evidence for Salmon Monitor Value, 16.3 µg/m ³ on 8-5-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	96 th percentile seasonally; 84 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 4 Direct Halstead plume impact on Salmon and possibly Scenario 3 valley drainage from Halstead plume intersection with Salmon/Lemhi valley (See Sec. 4)
	Weather Conditions:	Elongated, narrow ridge axis runs from OR to CO with apex over Central Mountains. Deformation of ridge elicits light winds aloft promoting stagnation conditions.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows large Halstead plume blowing northeast directly toward Salmon. Back trajectories intersect smoke from Halstead, Trinity Ridge, and Mustang fires. Hourly trace rises above 95 th percentile hourly values most of the morning and peaks > 25 µg/m ³ between 0900 and 1100. The hourly PM _{2.5} concentration is at or over the hourly 95 th percentile values for August for 13 hours.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temperature too warm for RWC. (See Sec. 4)
	Speciation:	IMPROVE data show carbon PM _{2.5} was higher in region from Aug thru Sept (p.)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 µg/m ³ (Avg-to-95%tile), thus, this event contributed 0.4 to 10.5 µg/m ³ and we conclude that there may not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	DEQ issued air quality forecast which included appropriate health messaging.

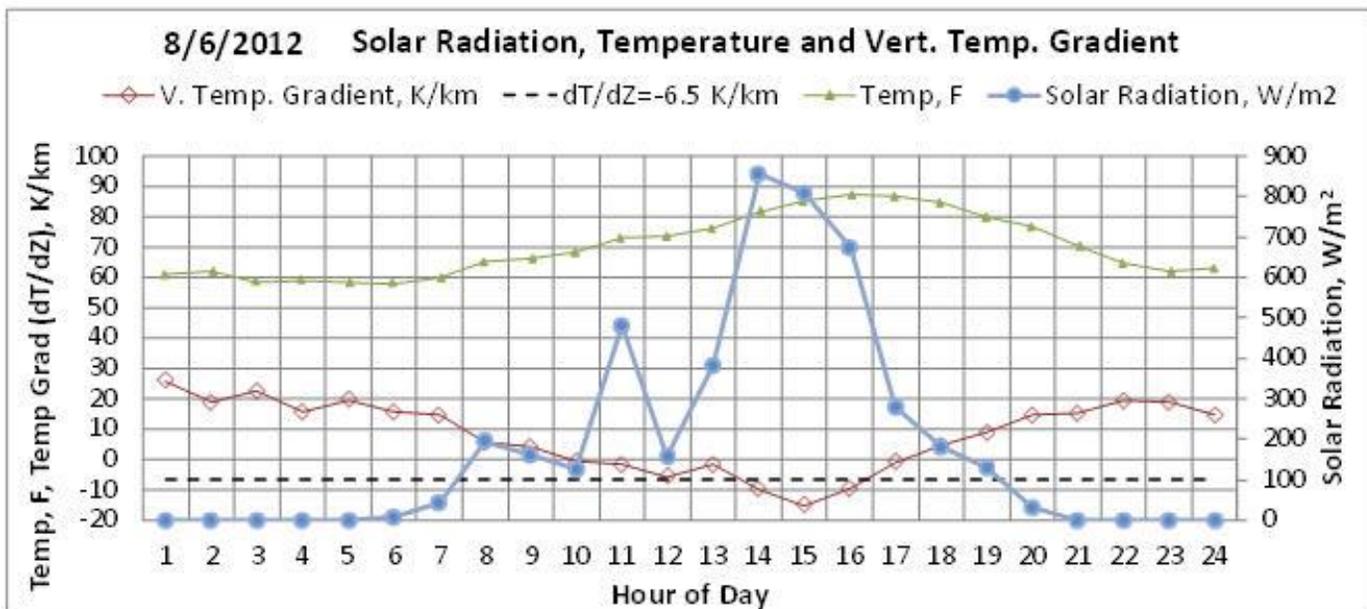
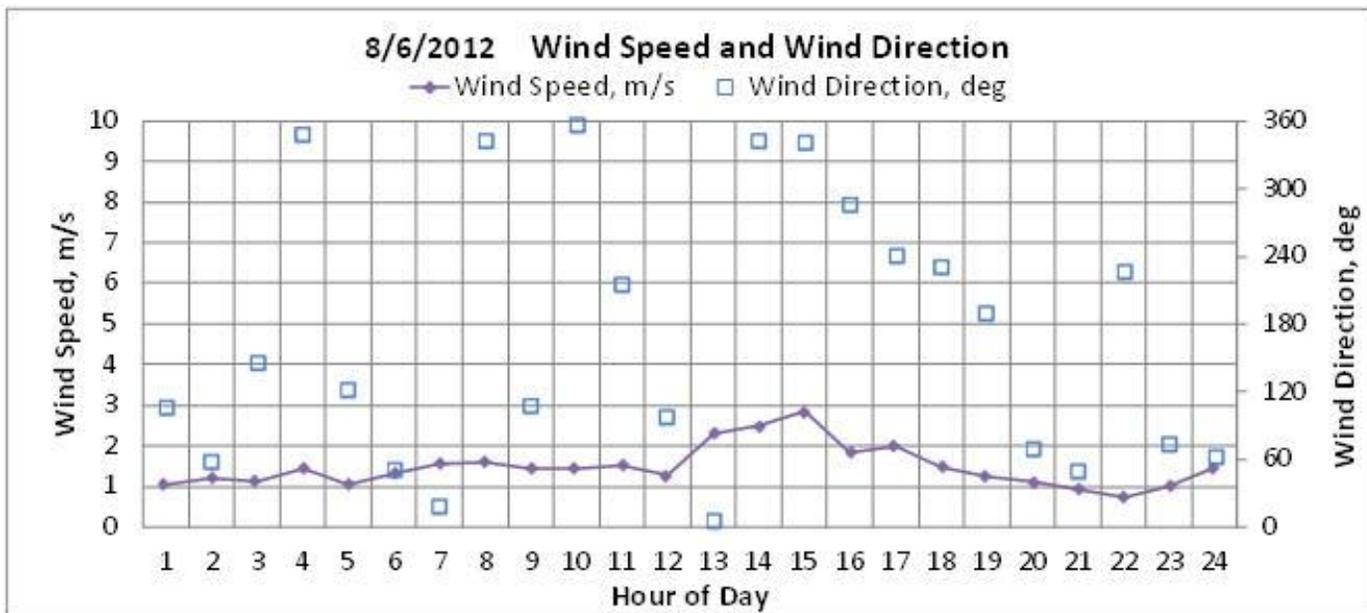
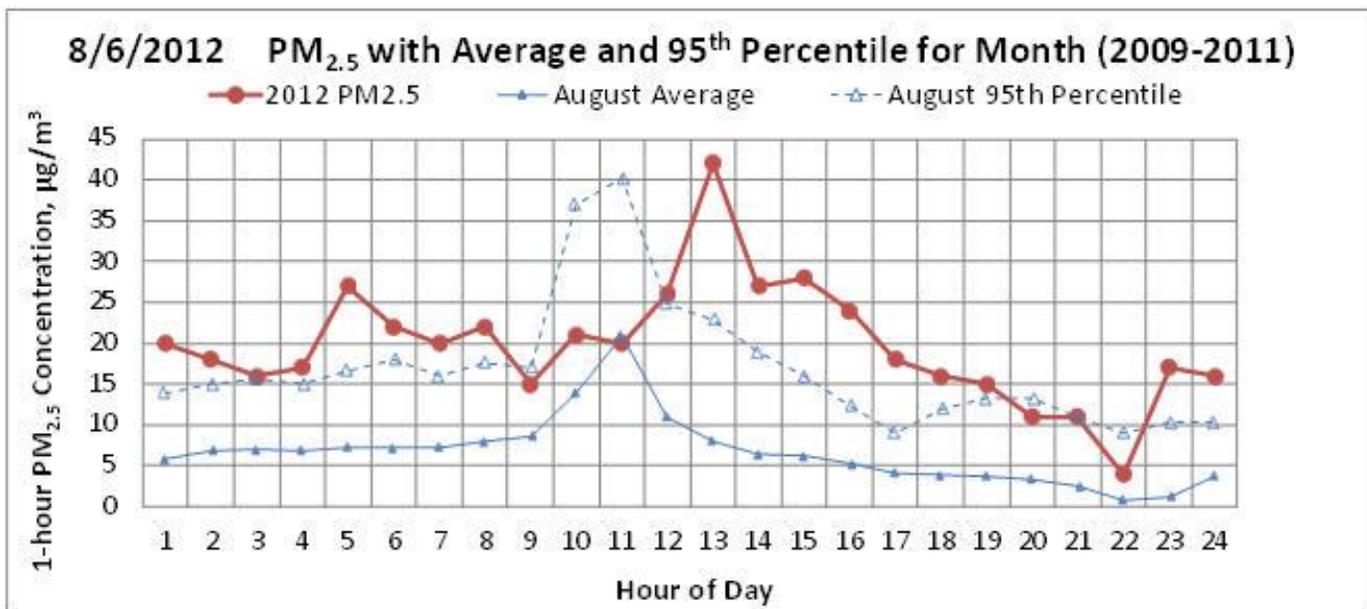




August 6, 2012

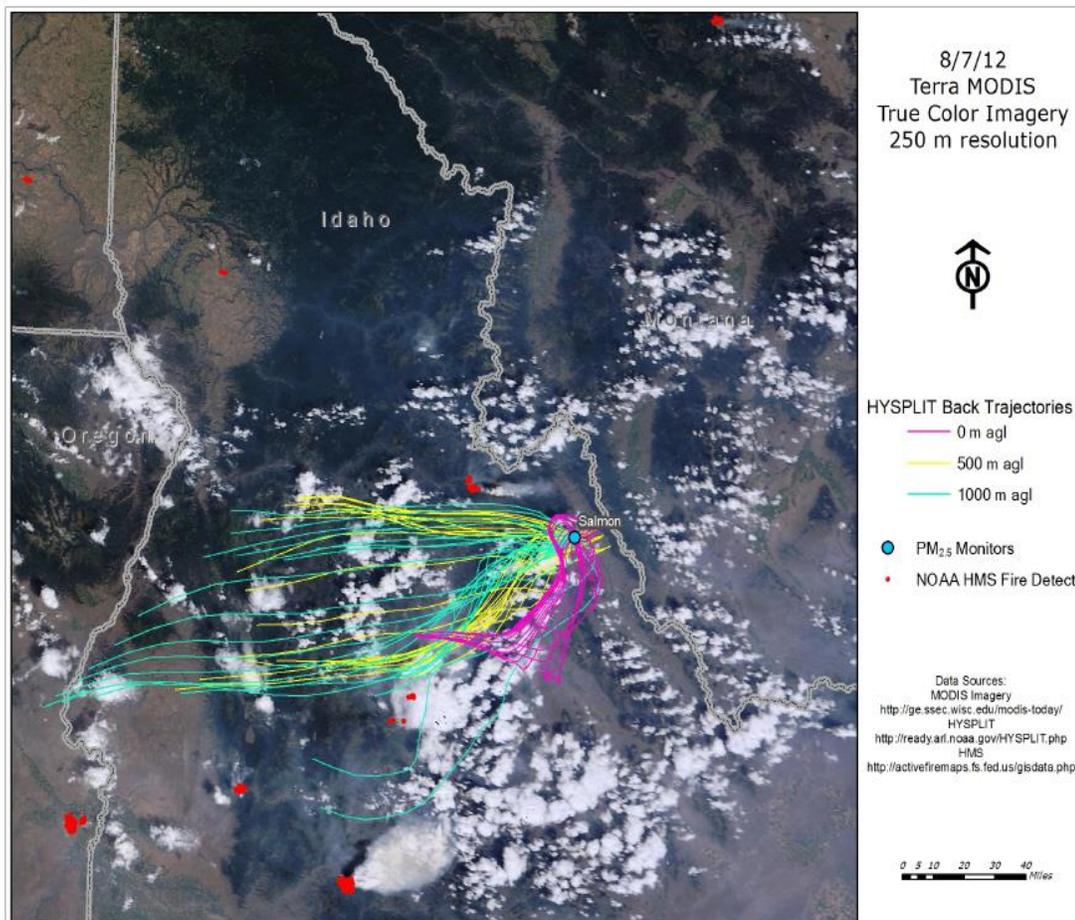
Summary of EER Evidence for Salmon Monitor Value, 19.7 µg/m ³ on 8-6-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	97 th percentile seasonally; 88 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2 (See Sec. 4). Some valley smoke from Halstead possible (Scenario 3)
	Weather Conditions:	Ridge axis running along the Continental Divide. Embedded shortwave accounts for northerly component across SW ID.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows Halstead and Trinity plumes blowing east adding smoke to the southern Lemhi Valley. Back trajectories indicate mostly westerly flow, but some 500 m trajectories intersect Mustang Complex fire detects to the northwest of Salmon. Surface trajectories show air parcels moving from the north of the valley to Salmon, bringing smoke that blew east from Mustang into the North Fork area. Hourly trace shows morning values above 95 th percentile hourly background values and a > 40 µg/m ³ spike occurred at 1300 when valley flows are from the north. Nineteen hourly PM _{2.5} values are at/over historical 95 th percentile values for August.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temperature too warm for RWC. (See Sec. 4)
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 µg/m ³ (Avg-to-95%tile), thus, this event contributed 3.8 to 13.9 µg/m ³ and we conclude that there may not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	DEQ issued air quality forecast which included appropriate health messaging.

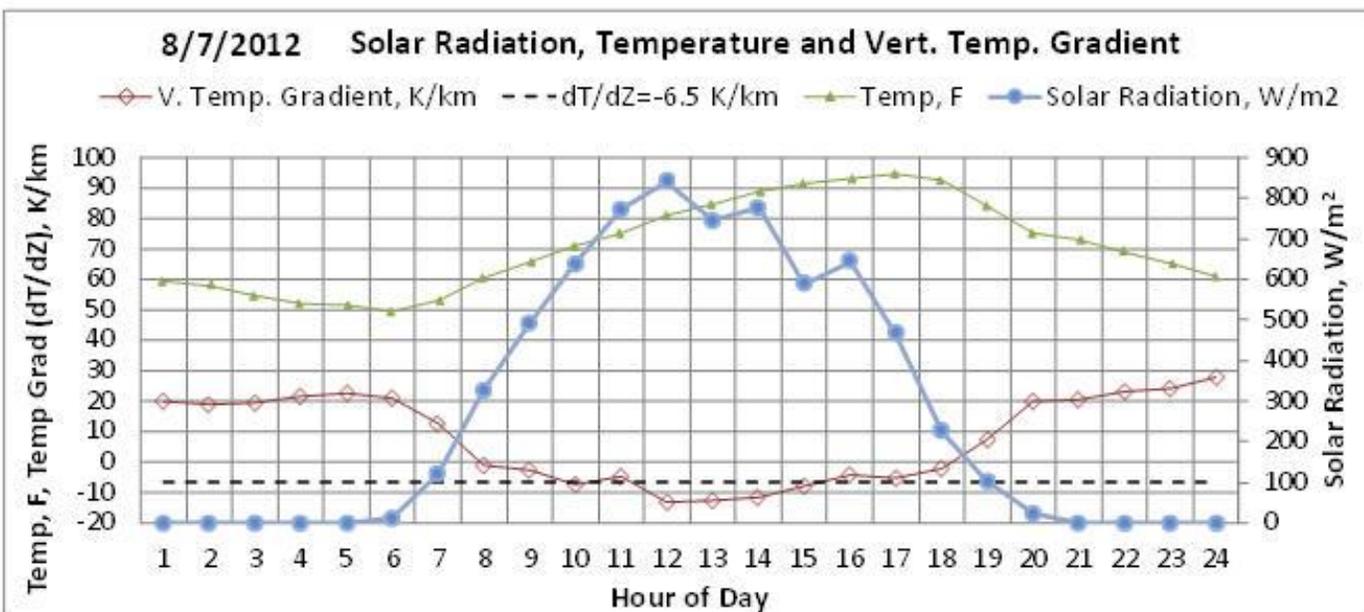
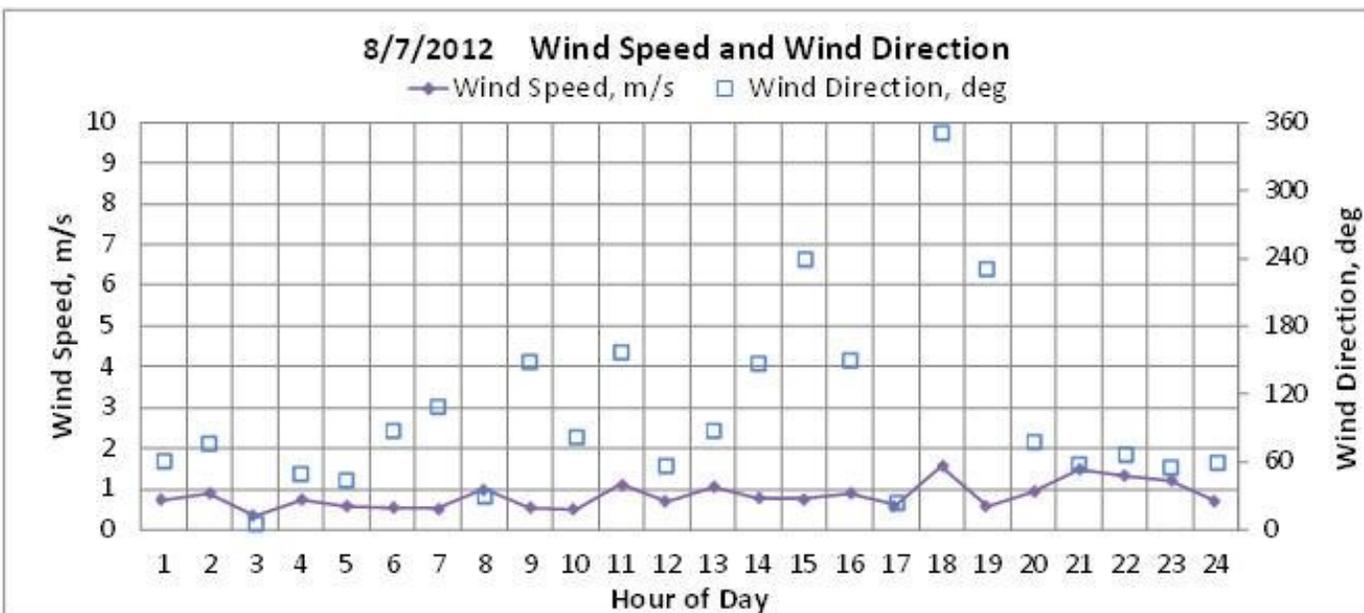
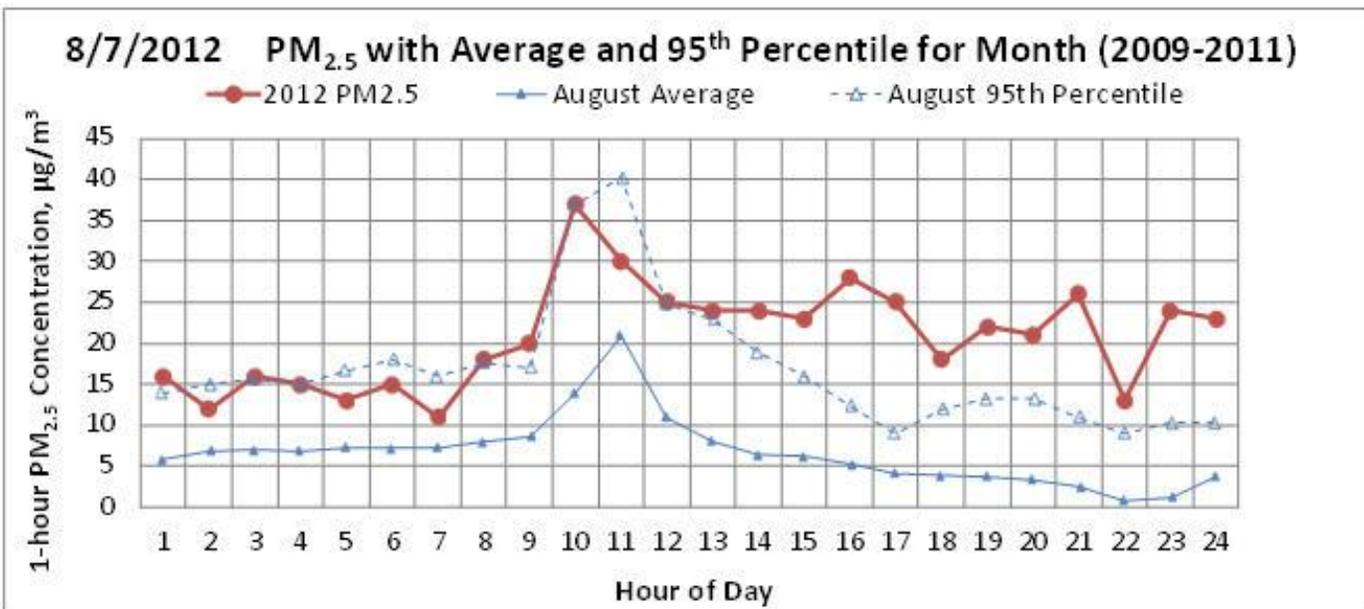




August 7, 2012

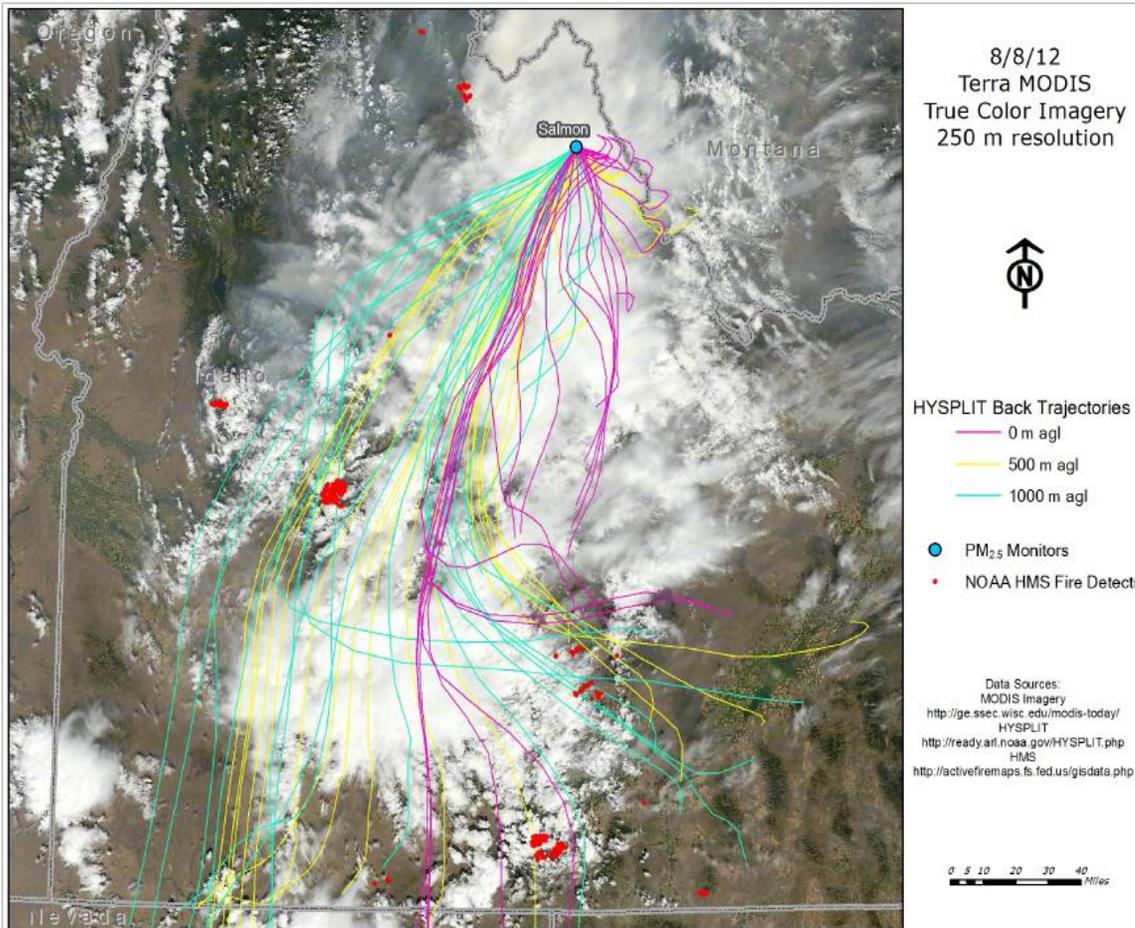
Summary of EER Evidence for Salmon Monitor Value, 20.5 µg/m ³ on 8-7-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	97 th percentile seasonally; 88 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2, direct flow from Mustang & valley flow, Scenario 4 direct Halstead smoke intersection. (See Sec. 4), and Scenario 5 regional transport.
	Weather Conditions:	Secondary low approaches the Pacific northwest and flattens ridge providing zonal flow over Idaho.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows visible smoke from Mustang Complex, Halstead, and Trinity fires heading east. Entire region is smoky. Back trajectories intersect smoke from Halstead fire and come close to Mustang smoke. Mustang plume is seen blowing directly toward valley between North Fork and Salmon. Hourly trace rises at 0700 and peaks at 1000 with winds from the SE, remaining above 20 µg/m ³ for the greater part of the day. Nineteen hourly PM _{2.5} values are at/over historical 95 th percentile values for August.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temperature too warm for RWC. (See Sec. 4)
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 µg/m ³ (Avg-to-95%tile), thus, this event contributed 4.6 to 14.7 µg/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 D	DEQ issued air quality forecast which included appropriate health messaging.

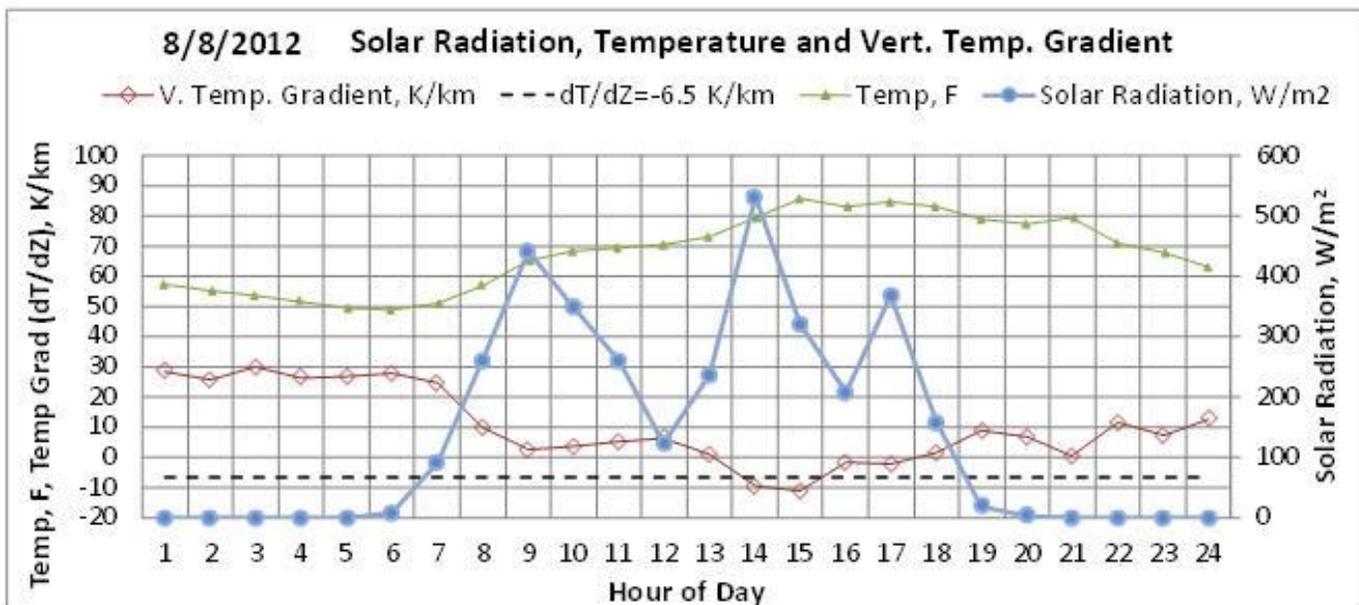
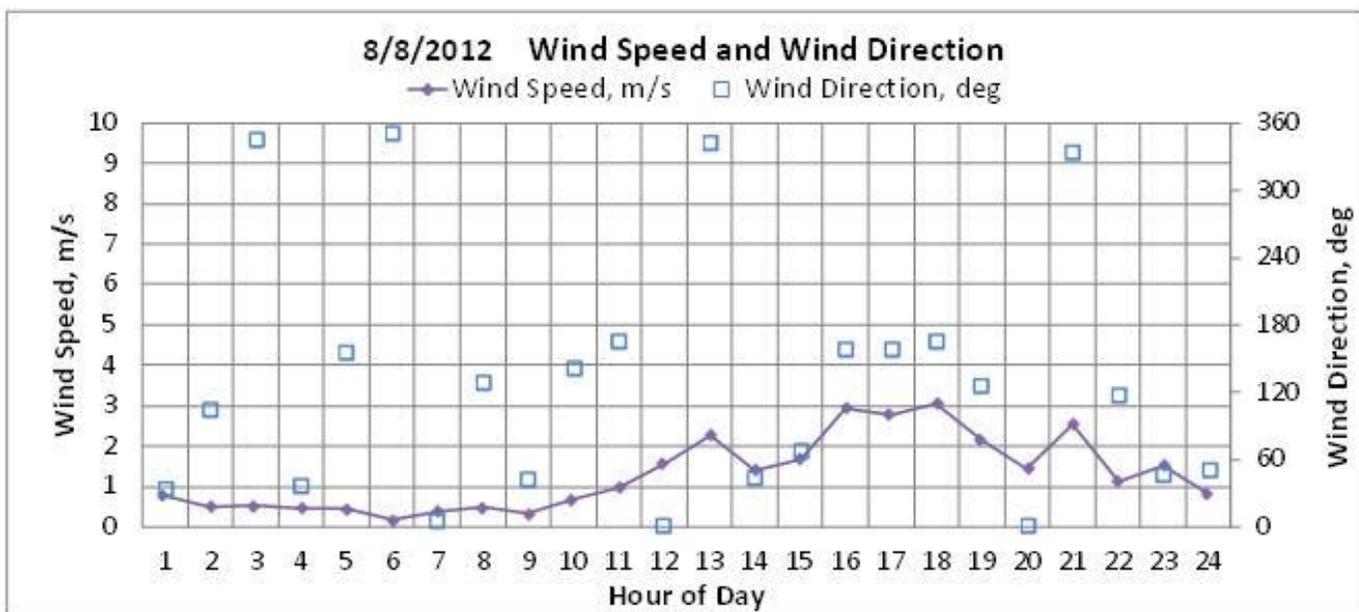
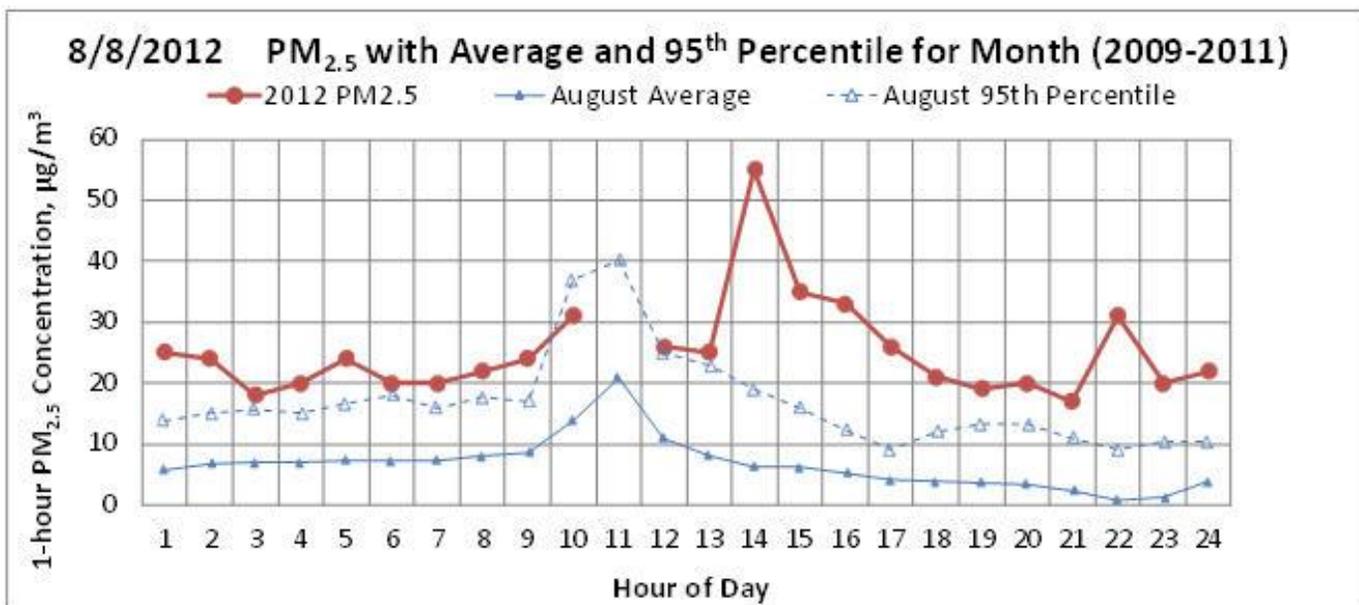




August 8, 2012

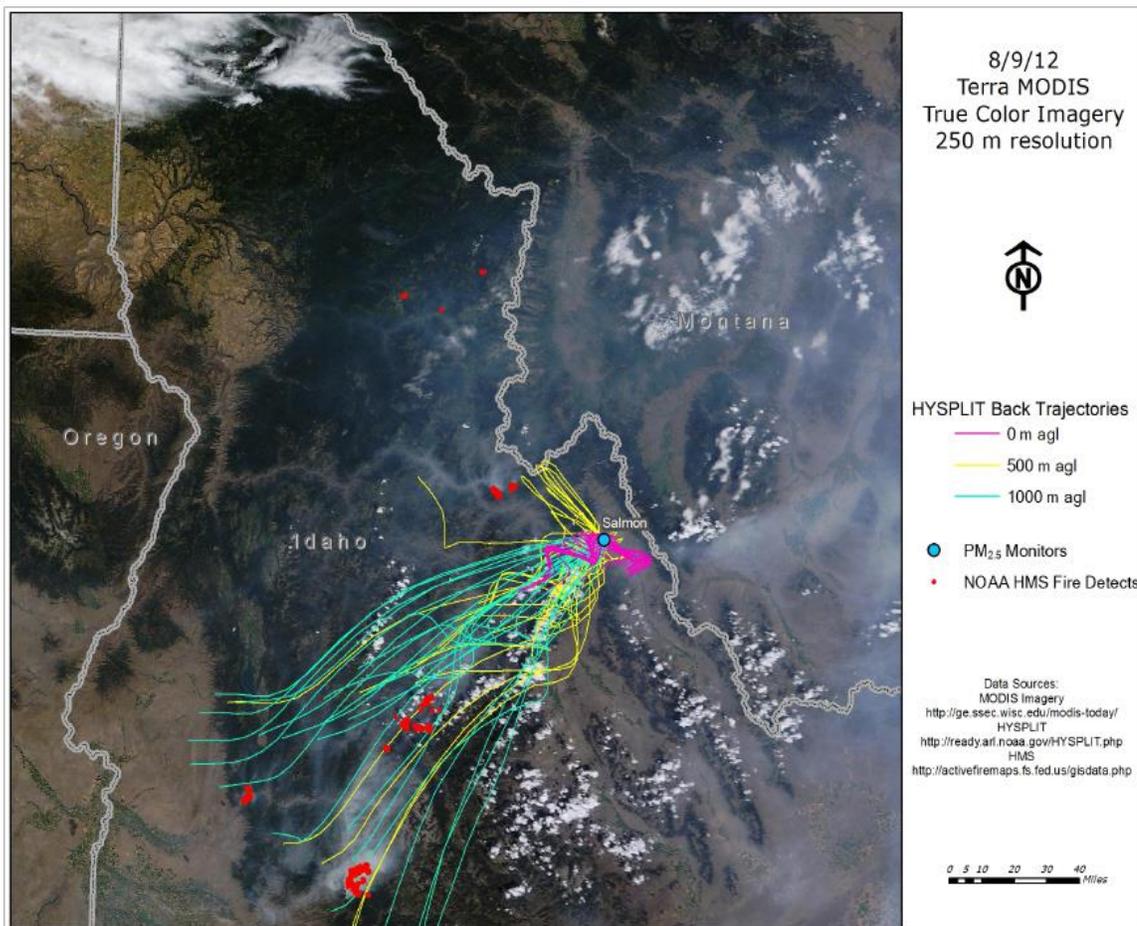
Summary of EER Evidence for Salmon Monitor Value, 25.1 $\mu\text{g}/\text{m}^3$ on 8-8-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; 92 nd percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 5, 4 (See Sec. 4). Some valley flow from Mustang, Scenario 1 possible.
	Weather Conditions:	Low weakens and fills while Four-Corners High pushes into SE Idaho. Accounts for strong SW flow while location of High Pressure accounts for weak wind speeds aloft.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows clouds obscuring most of the surface below back trajectories. Smoke is visible between the fire detects for the Springs fire and the Mustang Complex. Back trajectories intersect fire detects for Halstead, Trinity, Flat Top 2, and Minidoka Complex fires in Idaho and the Willow fire in Nevada. Hourly trace spikes at 1400, indicating possible direct flow from Halstead, although valley flow from Mustang is also possible due to N winds in the valley 1200-1300. Twenty-two hourly PM _{2.5} values are above historical 95 th percentile hourly values for August.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temperature too warm for RWC. (See Sec. 4)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 9.2 to 19.3 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	DEQ issued air quality forecast which included appropriate health messaging.

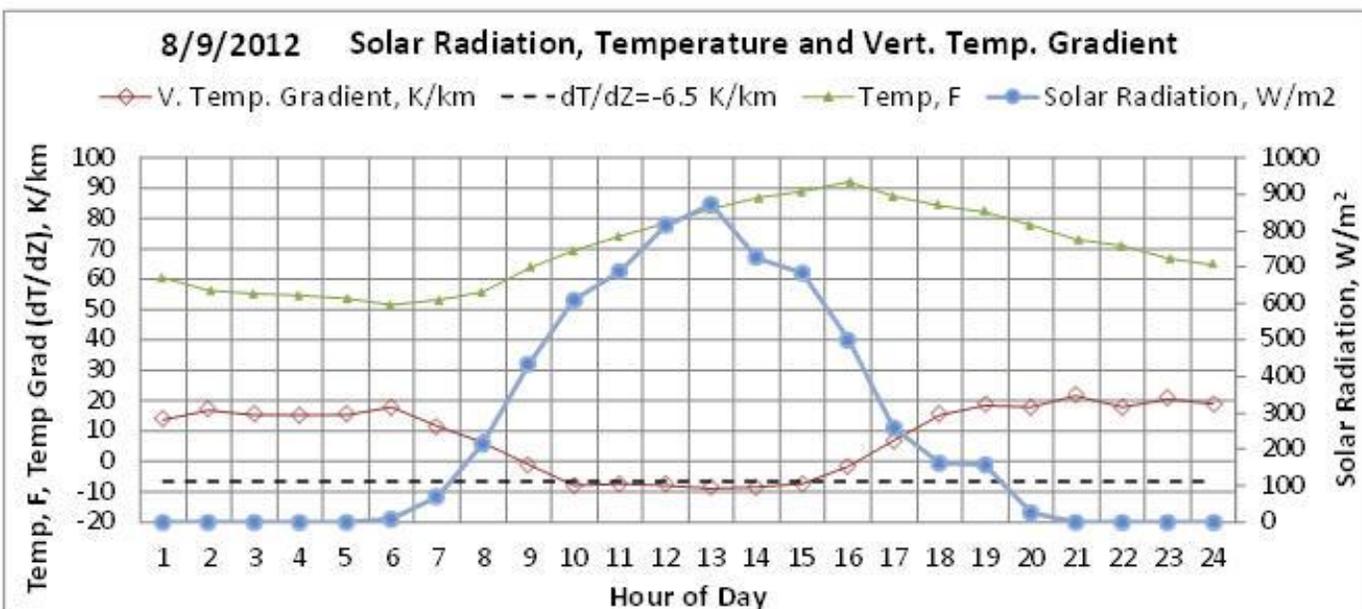
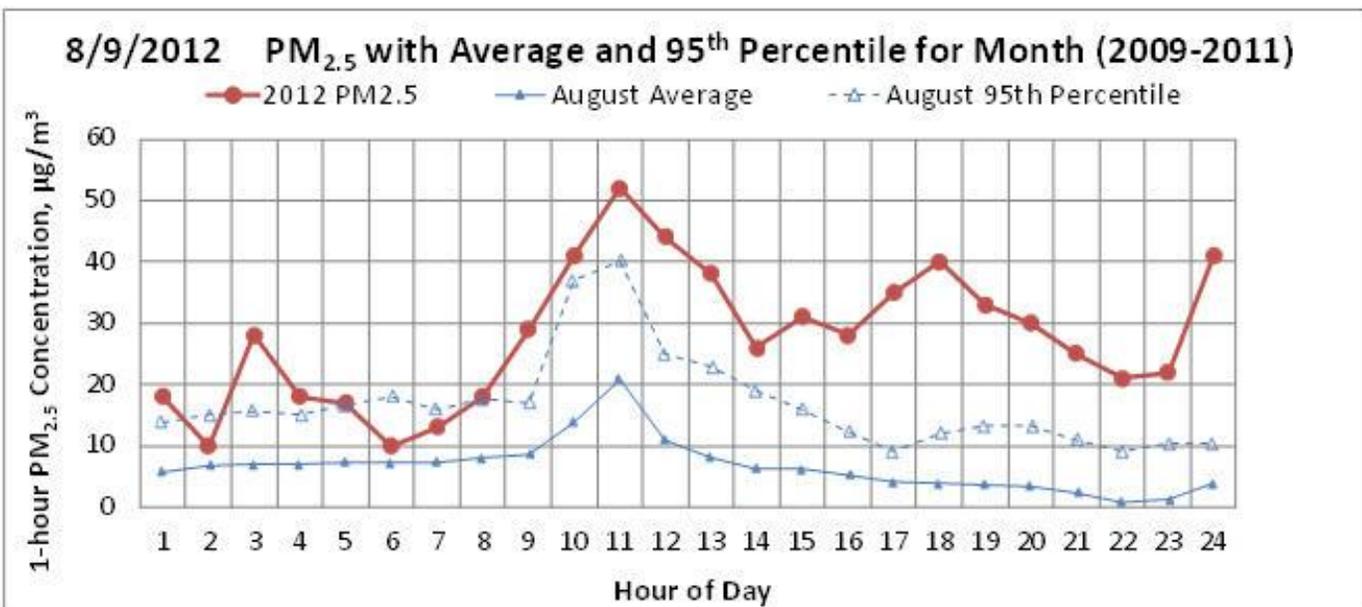




August 9, 2012

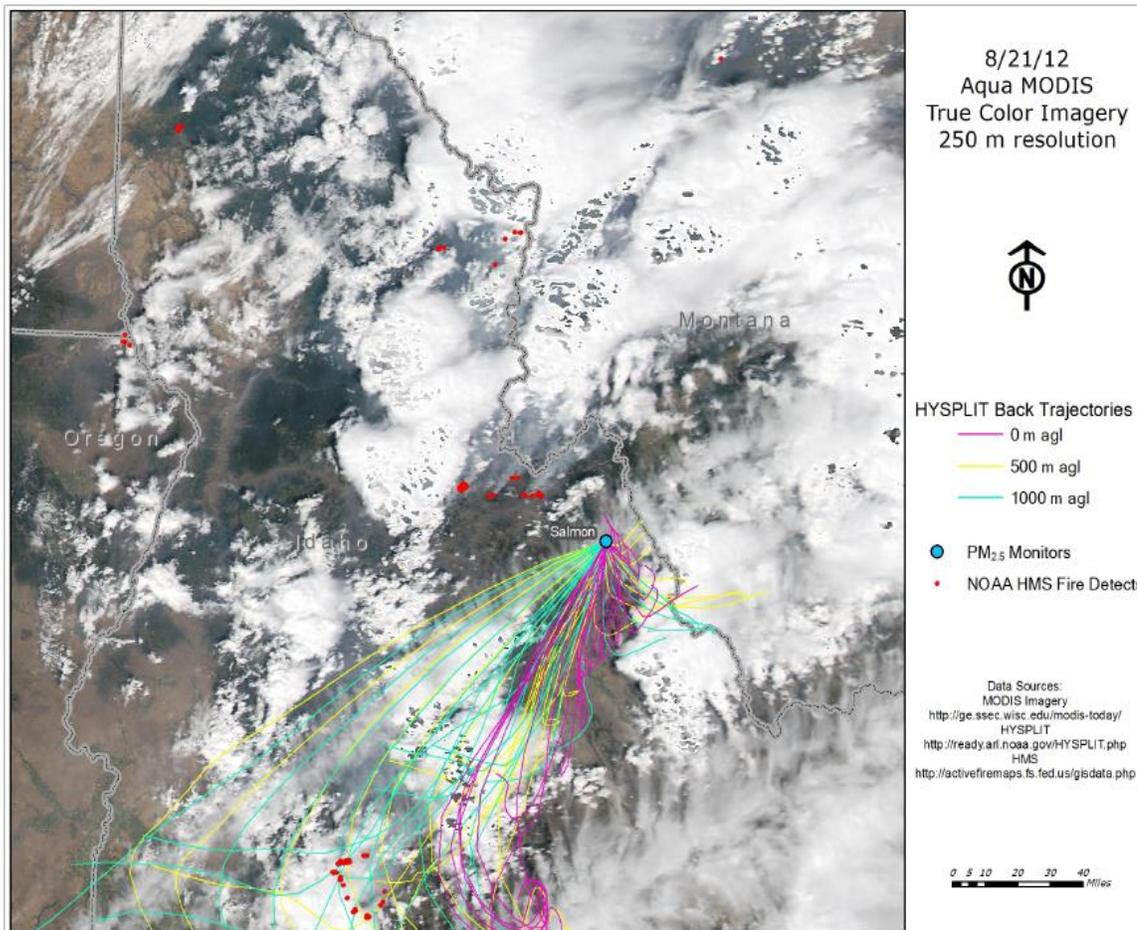
Summary of EER Evidence for Salmon Monitor Value, 27.0 µg/m ³ on 8-9-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; 93 rd percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2, 4 (See Sec. 4)
	Weather Conditions:	Low (now embedded shortwave) continues to progress east, affecting winds over SE Idaho by providing westerly component.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows visible smoke throughout the region. Back trajectories intersect smoke and/or fire detects from Halstead, Mustang, Trinity, and Springs fires. Hourly trace rises >40 µg/m ³ between 0600 and 1100 and then remains above 20 µg/m ³ for the remainder of the day with valley winds from north then south. Twenty one hours are at/above historical 95 th percentile hourly values.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temperature too warm for RWC. (See Sec. 4)
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 µg/m ³ (Avg-to-95%tile), thus, this event contributed 11.1 to 21.2 µg/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 D	DEQ issued air quality forecast which included appropriate health messaging.

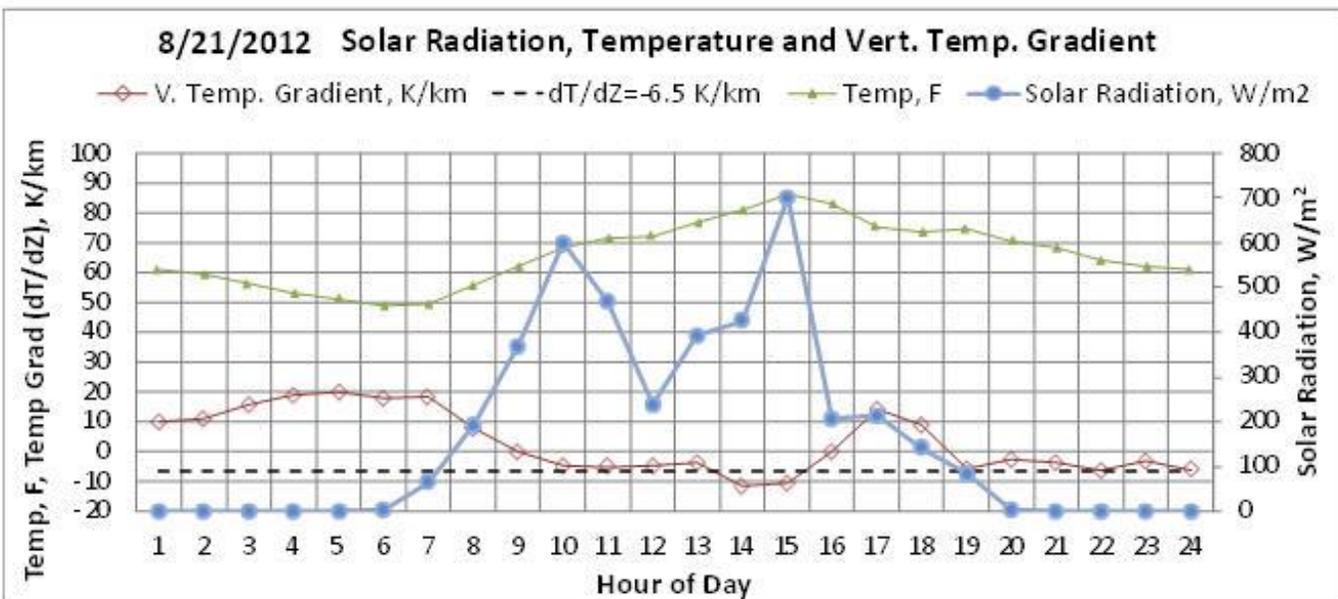
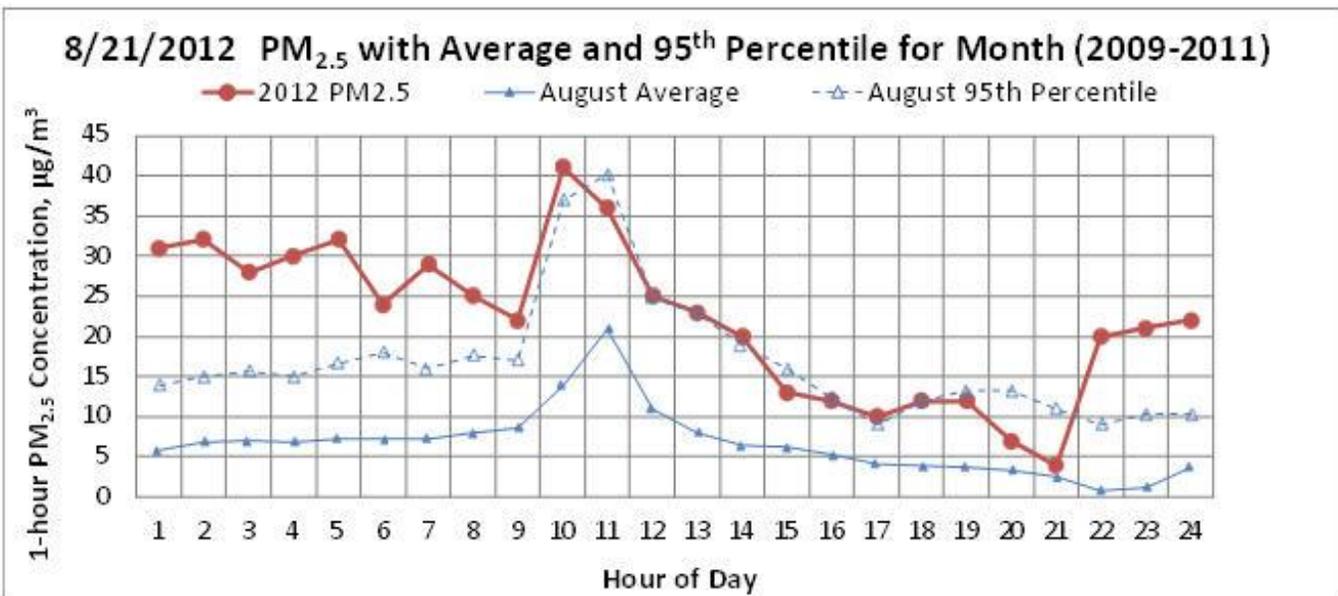




August 21, 2012

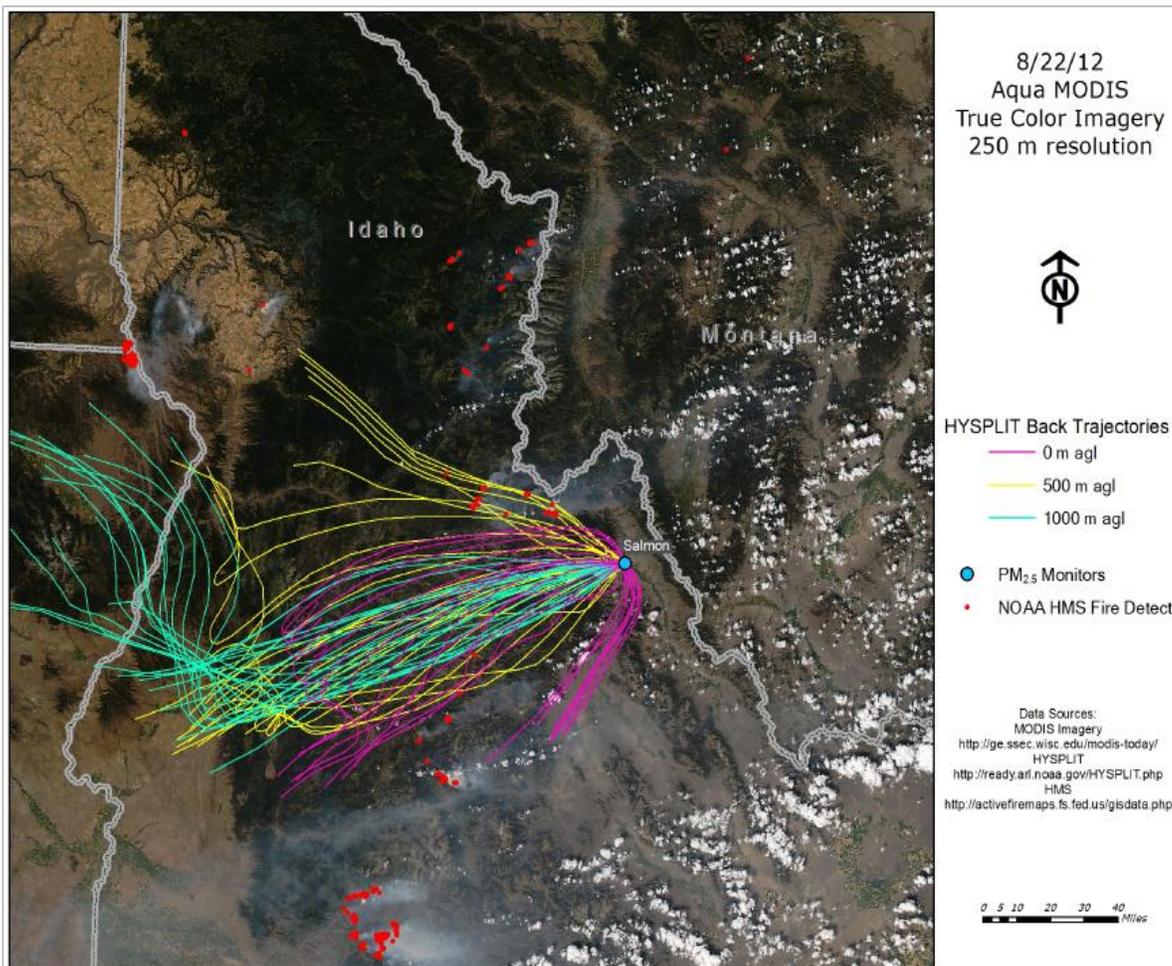
Summary of EER Evidence for Salmon Monitor Value, 22.2 µg/m ³ on 8-21-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	98 th percentile seasonally; 90 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 4 (See Sec. 4)
	Weather Conditions:	Ridge axis running from AZ/UT into eastern Alberta provides SW flow over Idaho.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows smoke mixed with thick cloud region-wide. Back trajectories intersect smoke and/or fire detects from the Halstead and Trinity Ridge fires. Hourly trace shows elevated concentrations in the morning trapped by stable conditions from the previous day. A spike occurs at 1000, and another spike occurs at 2200, after which concentrations remain high. Nineteen hourly PM _{2.5} values are at/above the 95 th percentile values for August.
	Alternative Hypotheses:	Stage 1 Forecast and Caution prohibits all open burning. Too warm for RWC. See Sec 4.
AAQ	See discussion, Sec 5.	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
NE/HAURL	See discussion, Sec 6.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criterion is also met.
Mitigation:	See Sec 8 and Appendix D	Normal Fluctuations above the average are 5.8 to 15.9 µg/m ³ (Avg-to-95%tile), thus, this event contributed 6.3 to 16.4 µg/m ³ and we conclude that there may not have been concentrations above the Annual NAAQS "but for" this contribution.
		Stage 1 Forecast and Caution in effect, advised residents of protective actions.

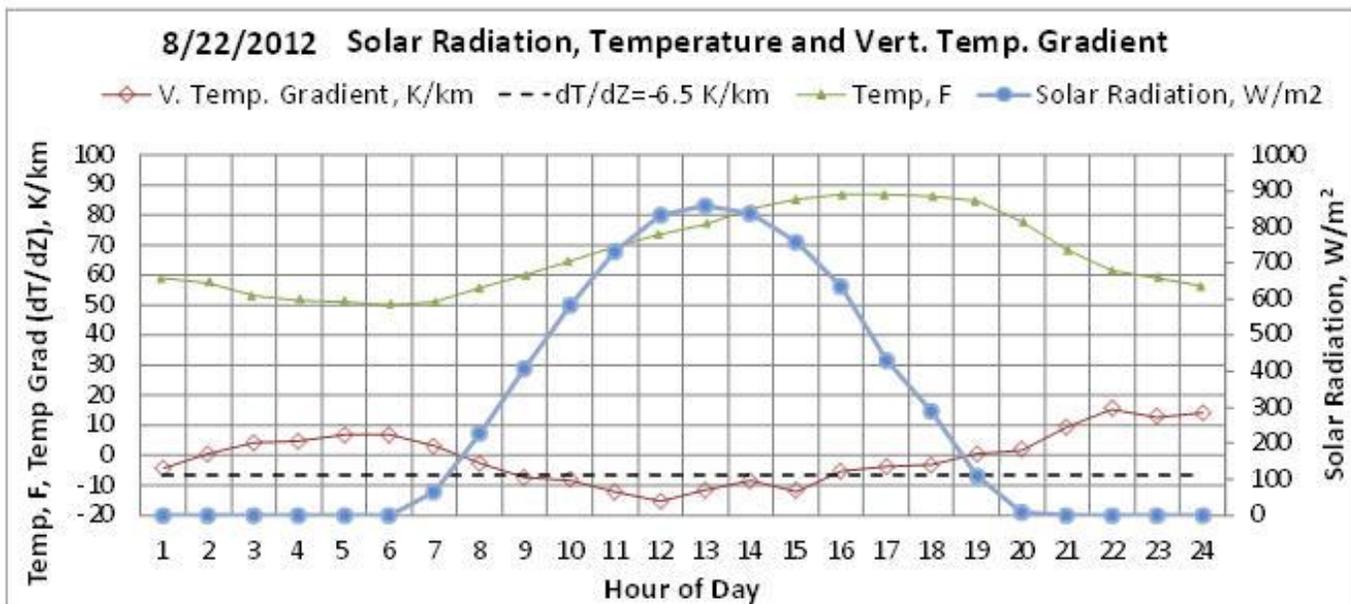
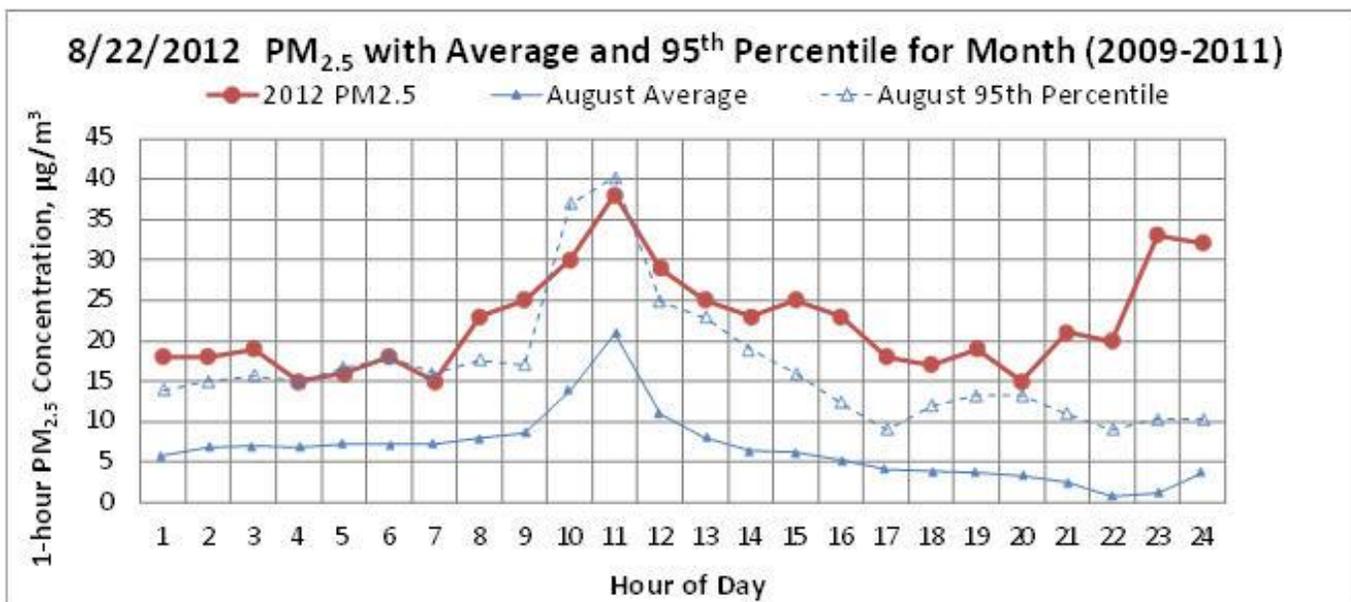




August 22, 2012

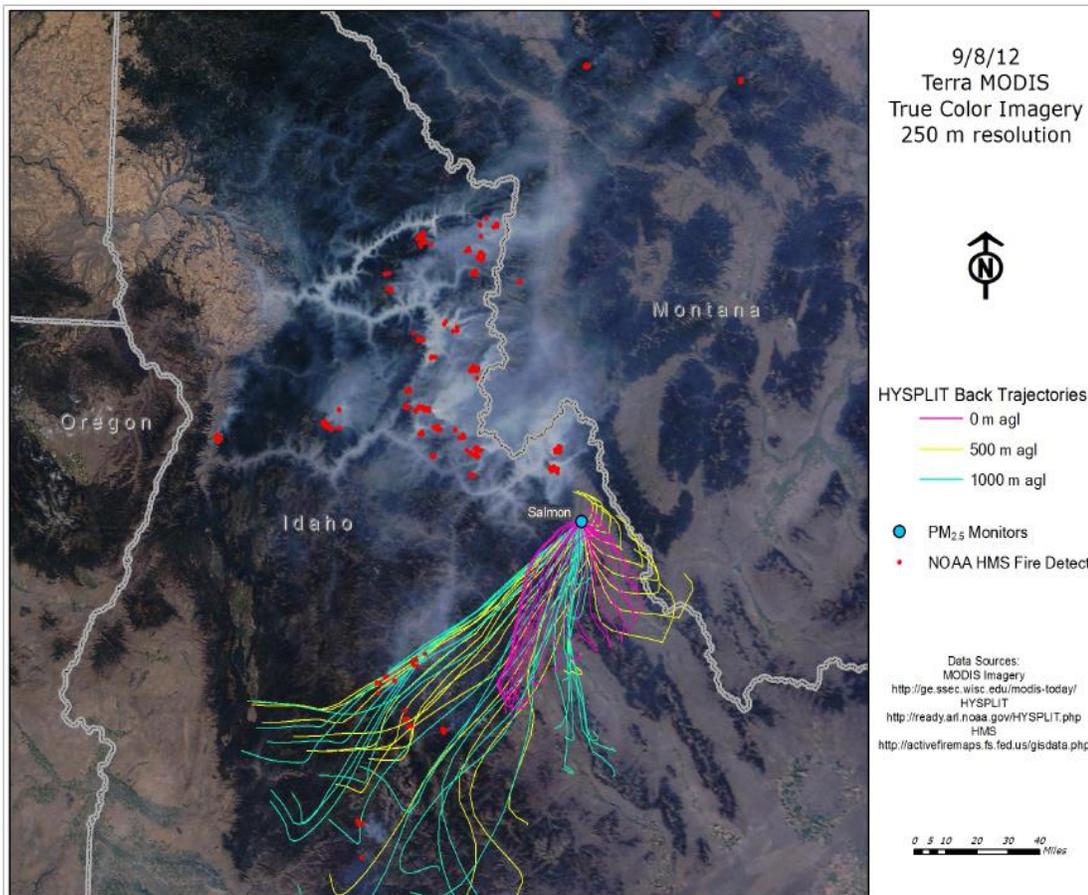
Summary of EER Evidence for Salmon Monitor Value, 21.8 µg/m ³ on 8-22-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	98 th percentile seasonally; 89 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2, 3 (See Sec. 4)
	Weather Conditions:	Shortwave enters over central CA and pushes ridge axis to the Great Plains. Provides zonal flow over Idaho with slight SW component.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows light smoke emanating from all local fires and filling the valley north and south of Salmon. Back trajectories intersect smoke and/or fire detects from the Halstead and Mustang fires. Hourly trace shows a daily peak of ~ 37 µg/m ³ at 1100 remaining above 95 th percentile values. PM _{2.5} levels are at or above the historical 95 th percentile hourly values for August during 20 of 24 hours.
	Alternative Hypotheses:	Stage 1 Forecast and Caution prohibits all open burning. Too warm for RWC. See Sec 4.
AAQ	See discussion, Sec 5.	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
NE/HAURL	See discussion, Sec 6.	Affects Air Quality (AAQ) criterion is satisfied by HF and CCR demonstration. Natural event-lightning caused wildfires. Per (EPA 2013) guidance, if nRCP and CCR criteria are satisfied, the AAQ criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 µg/m ³ (Avg-to-95%tile), thus, this event contributed 5.9 to 16.0 µg/m ³ and we conclude that there may not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	Stage 1 Forecast and Caution in effect, advised residents of protective actions.

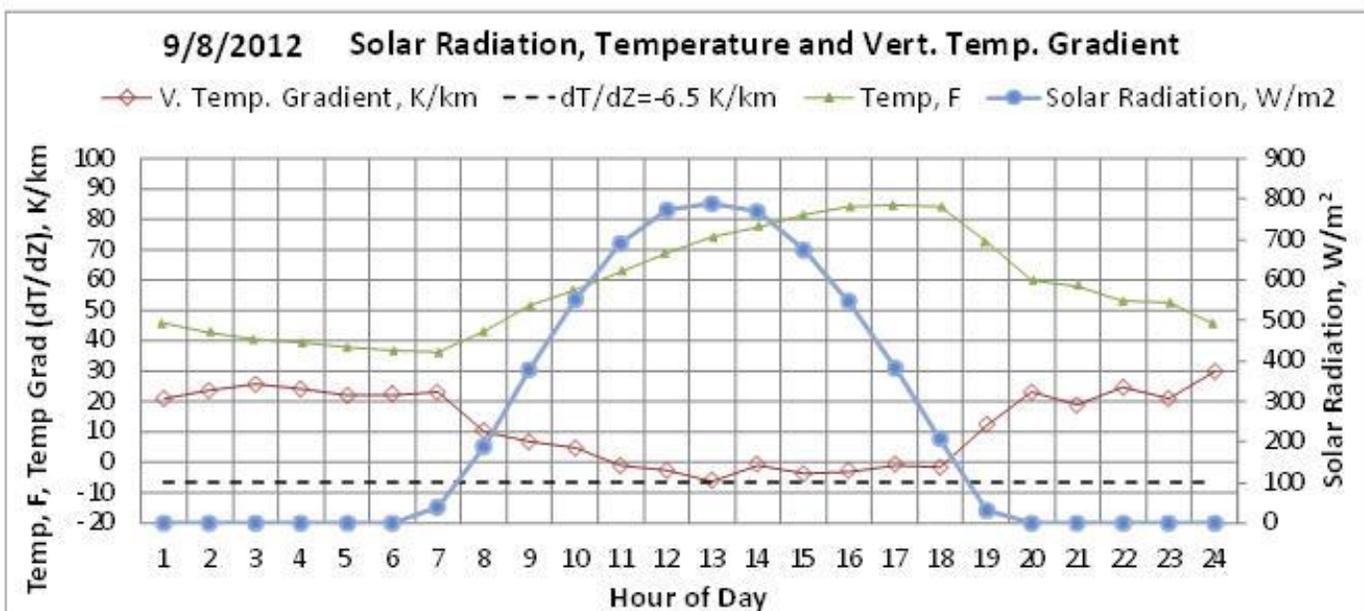
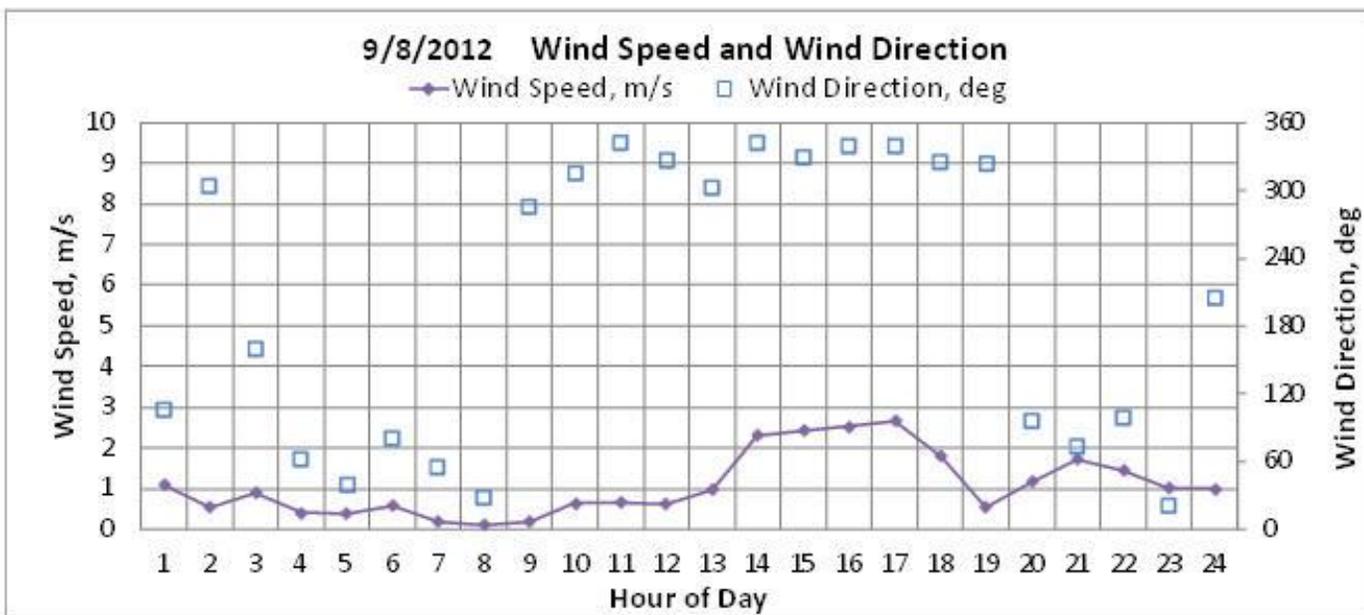
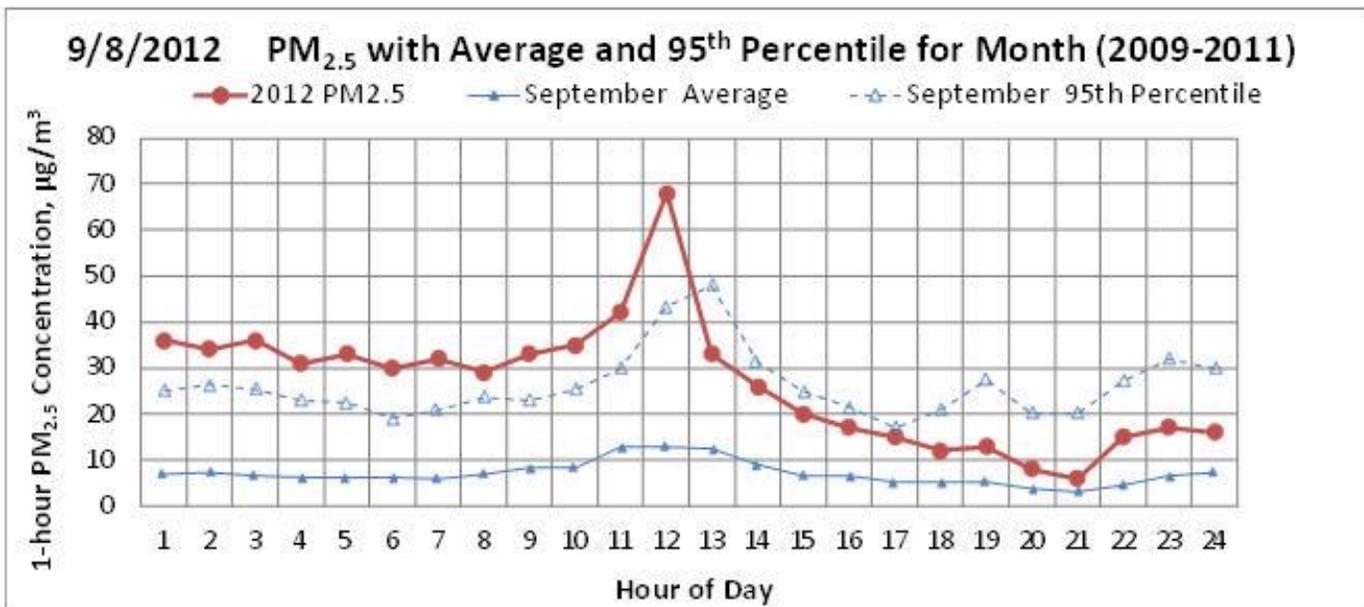




September 8, 2012

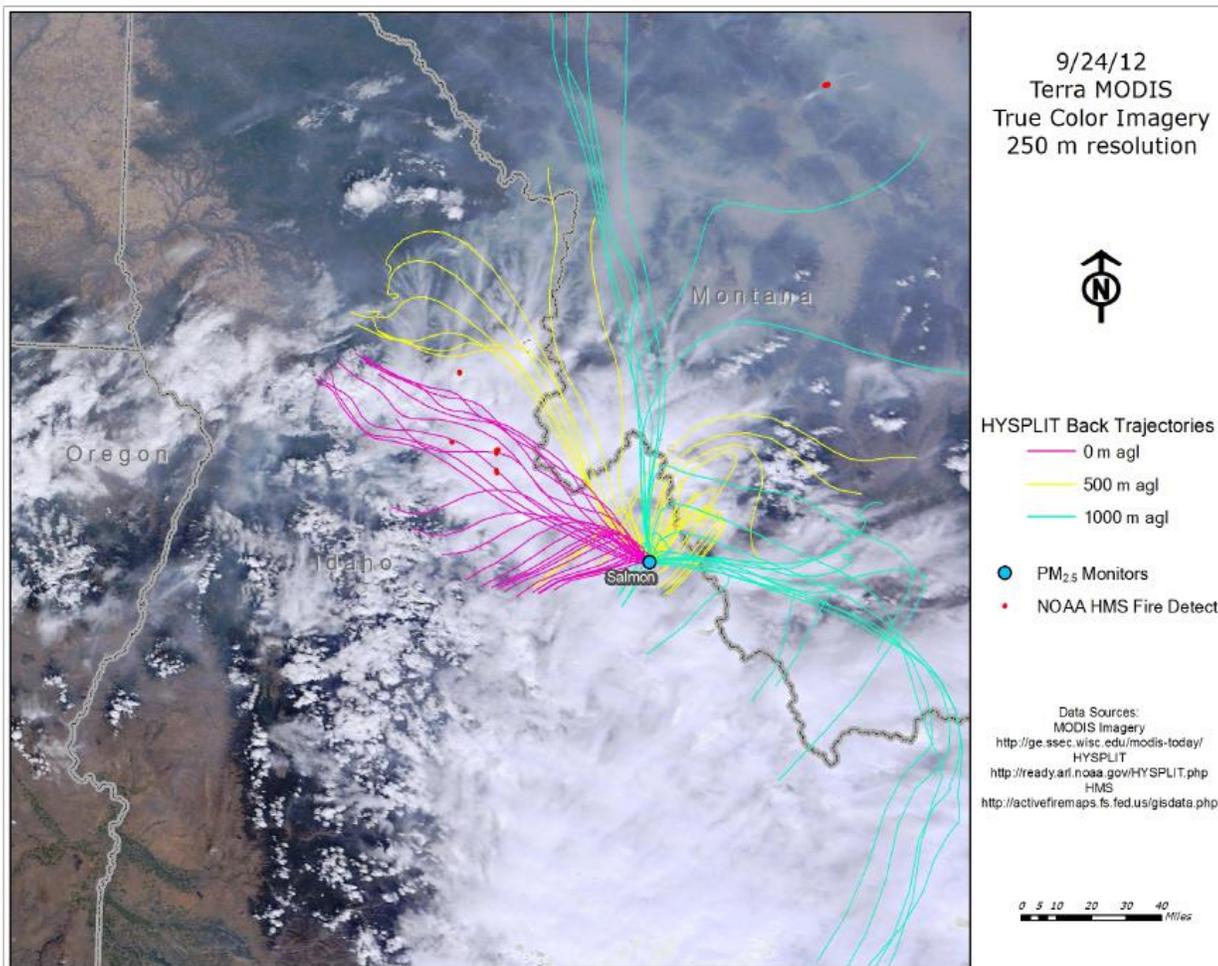
Summary of EER Evidence for Salmon Monitor Value, 27.5 $\mu\text{g}/\text{m}^3$ on 9-8-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably 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 1, 3, 4 (See Sec. 4)
	Weather Conditions:	Four-Corners High strengthens and extends through nearly all of Idaho into Canada providing weak winds and a southerly-driven synoptic wind however up-valley flows still occur from the north after 0900.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image exhibits typical conditions after a night of stagnation. Thick smoke is nestled into river drainages, highlighting the Middle Fork, Clearwater, Selway, and Lochsa Rivers. Smoke has filled the valley north and mountains NW of Salmon. Back trajectories travel from the south and southwest towards Salmon and intersect smoke and/or fire detects from the Halstead and Trinity fires. Hourly trace indicates overnight smoke remaining in Salmon during the morning and a spike from a direct plume impact or valley flow from the north occurs around noon. PM _{2.5} levels exceed the historical 95 th percentile levels for all 12 morning hours.
	Alternative Hypotheses:	Stage 1 Forecast and Caution prohibits all open burning. Too warm for RWC. See Sec 4.
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 11.6 to 21.7 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	Stage 1 Forecast and Caution in effect, advised residents of protective actions.

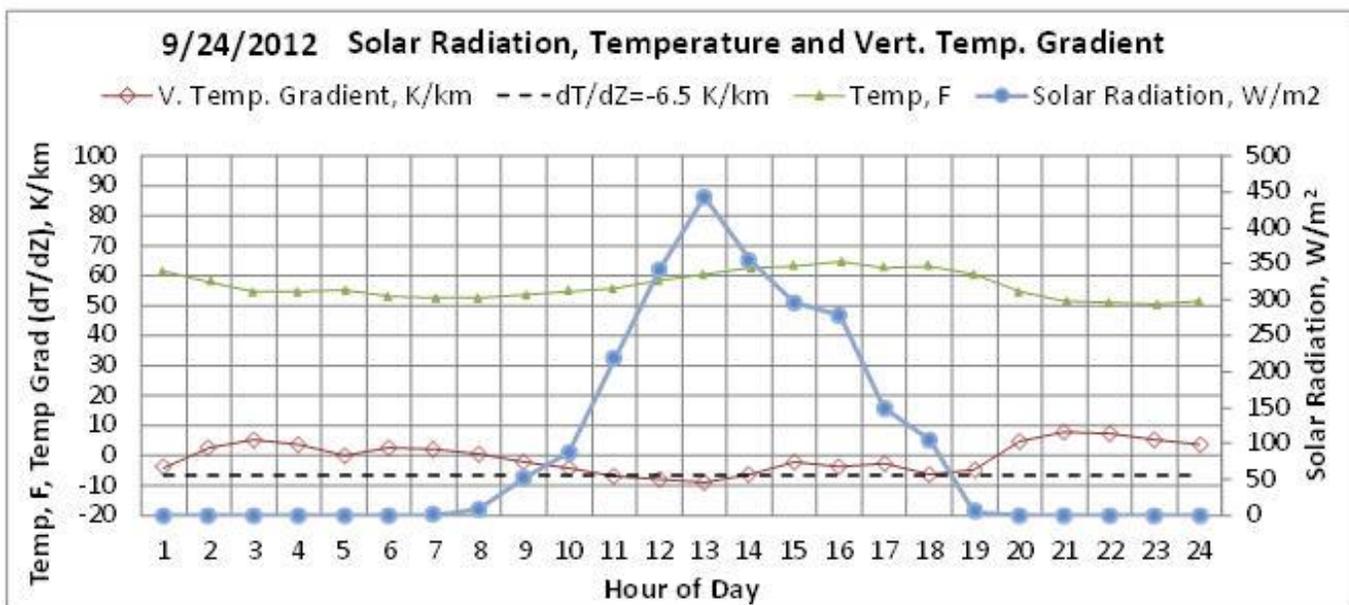
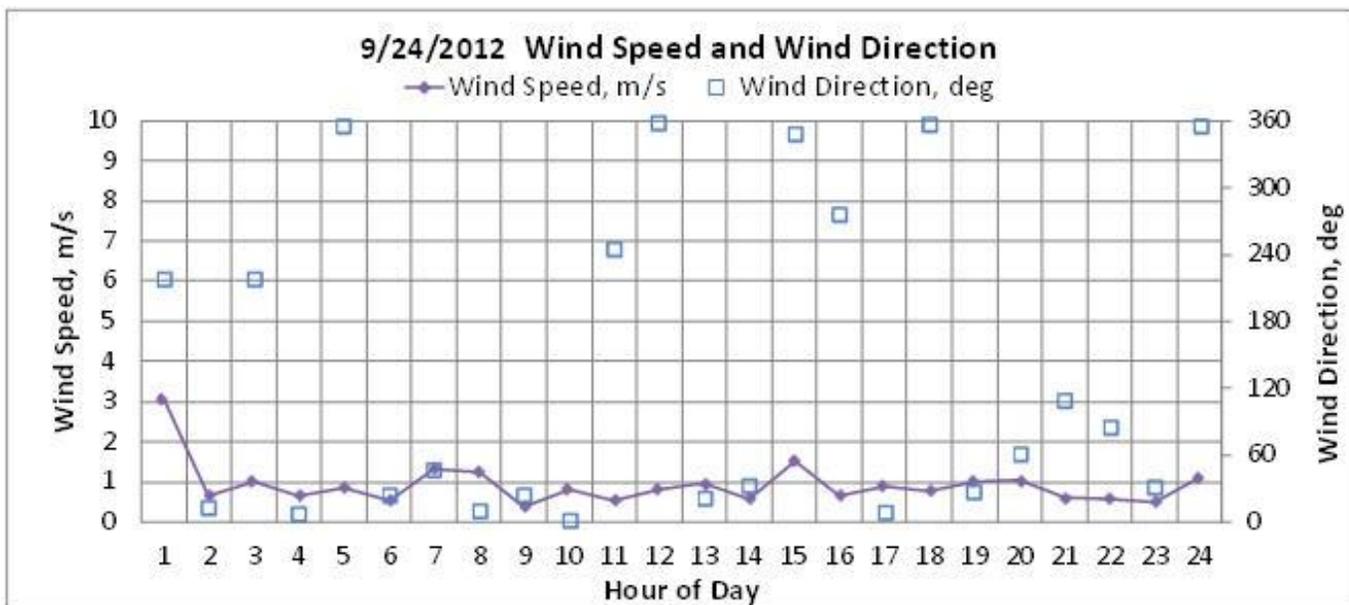
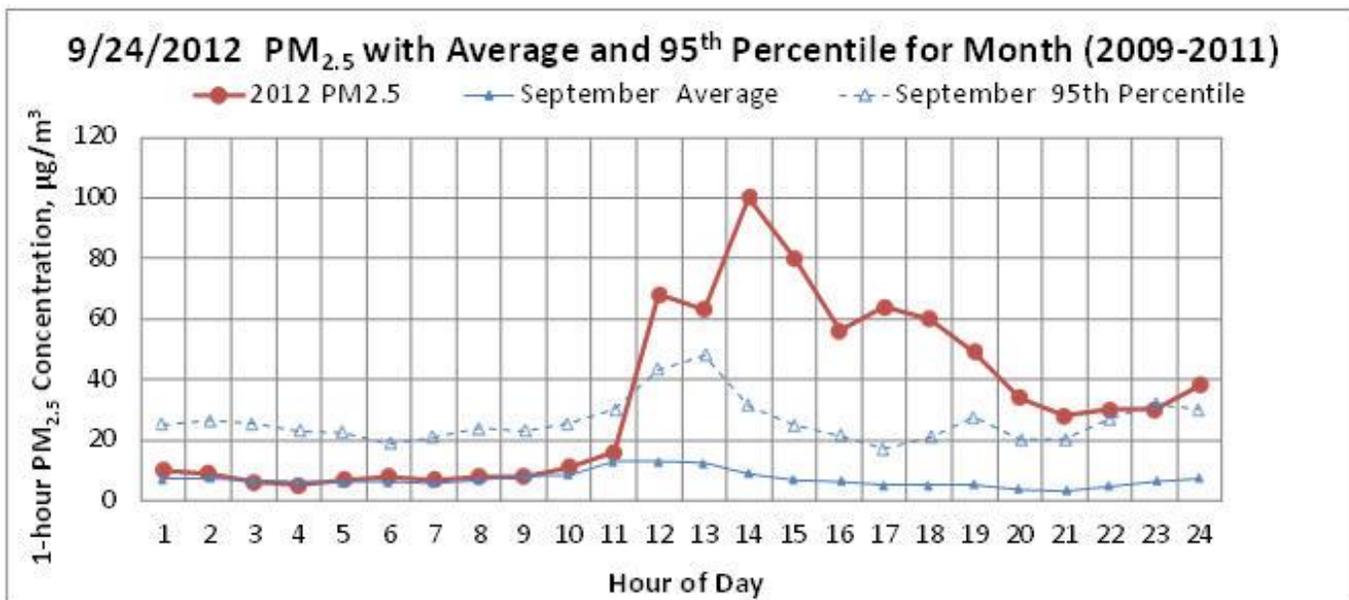




September 24, 2012

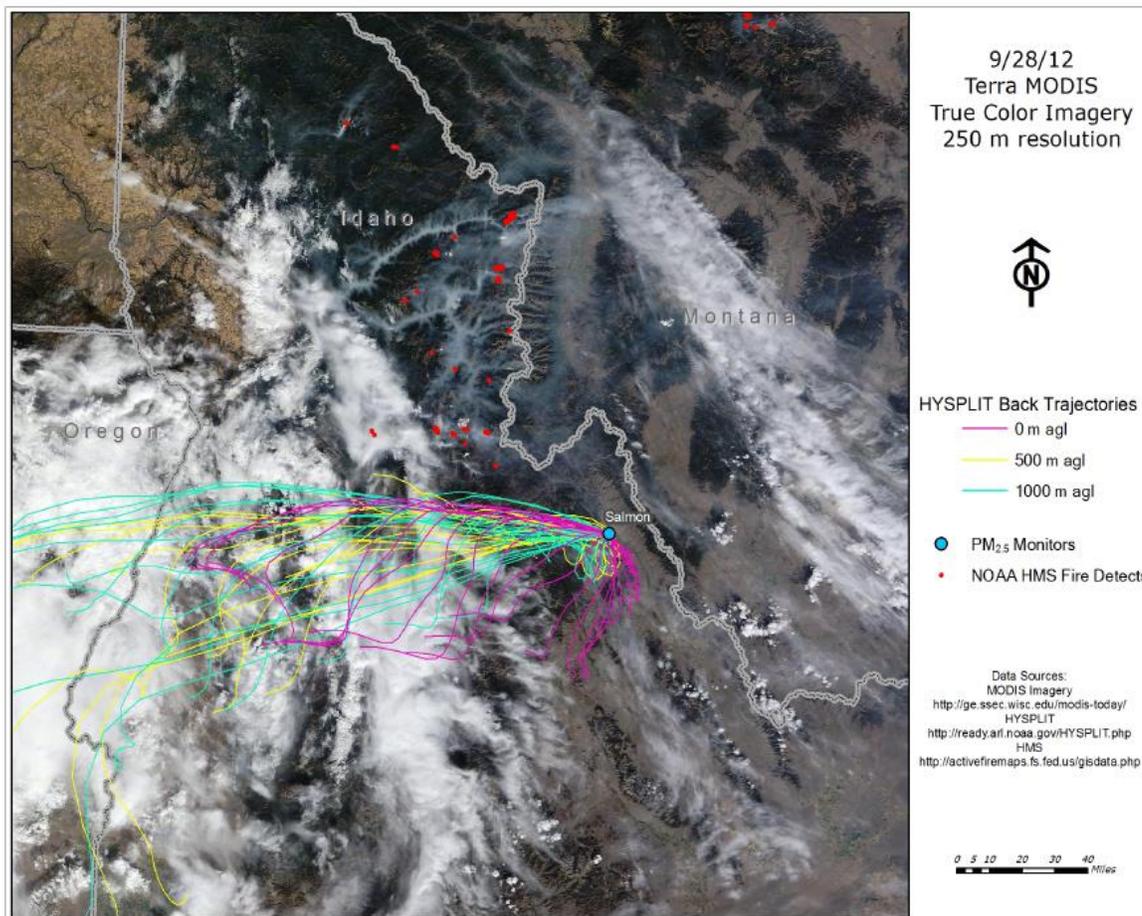
Summary of EER Evidence for Salmon Monitor Value, 31.8 $\mu\text{g}/\text{m}^3$ on 9-24-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; 96 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2 (See Sec. 4)
	Weather Conditions:	Low stalls and ridging develops over north Idaho. Variable wind directions and light winds experienced at 500mb level.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows smoke in Montana, north of Salmon. Cloud obscures the surface in Salmon and prevents local fire detects. Back trajectories intersect smoke and/or fire detects from the Mustang fire. Hourly trace indicates clear air in the morning, then at 1200 concentrations rise to 100 $\mu\text{g}/\text{m}^3$ in 3 hours. PM _{2.5} is at or above historical 95 th percentile hourly levels for 13 hours after 1100.
	Alternative Hypotheses:	Stage 1 Forecast and Caution prohibits all open burning. Too warm for RWC. See Sec 4.
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 $\mu\text{g}/\text{m}^3$ (Avg-to-95 th tile), thus, this event contributed 15.9 to 26.0 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	Stage 1 Forecast and Caution in effect, advised residents of protective actions.

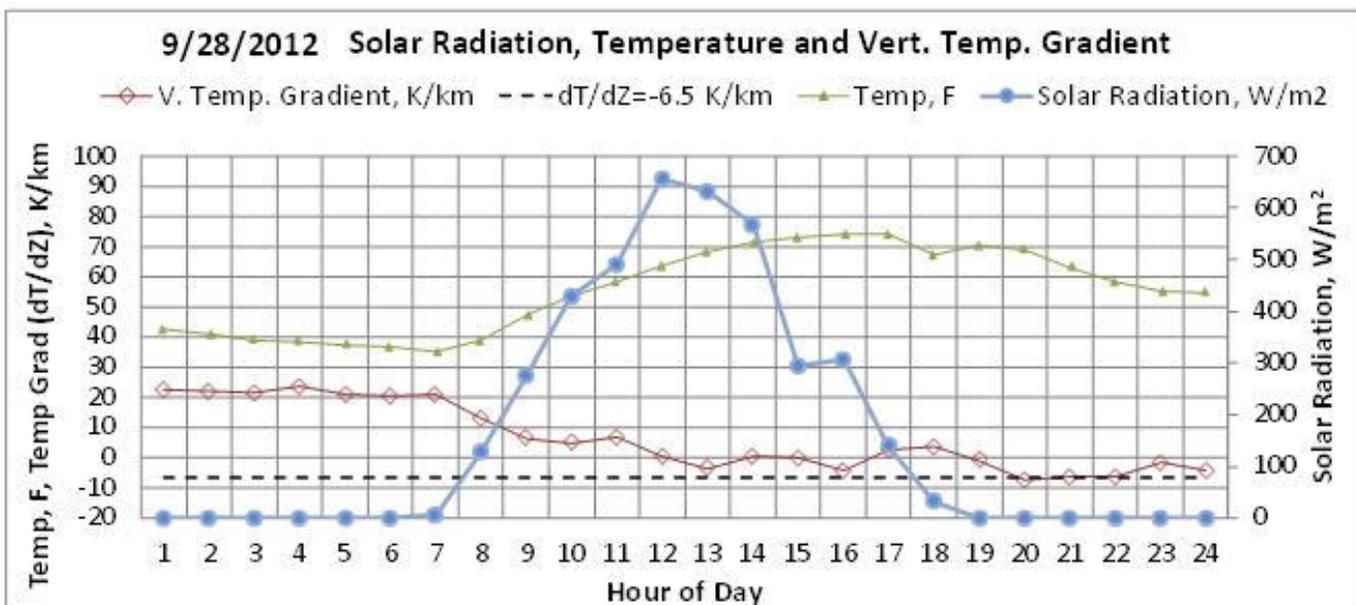
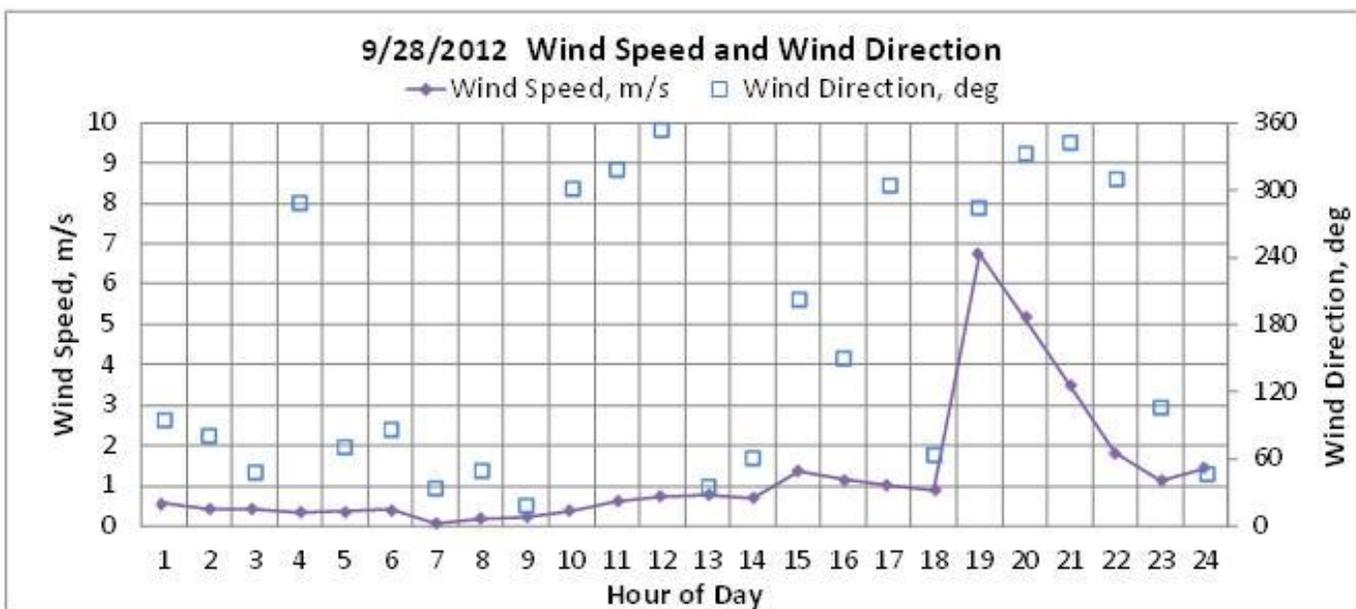
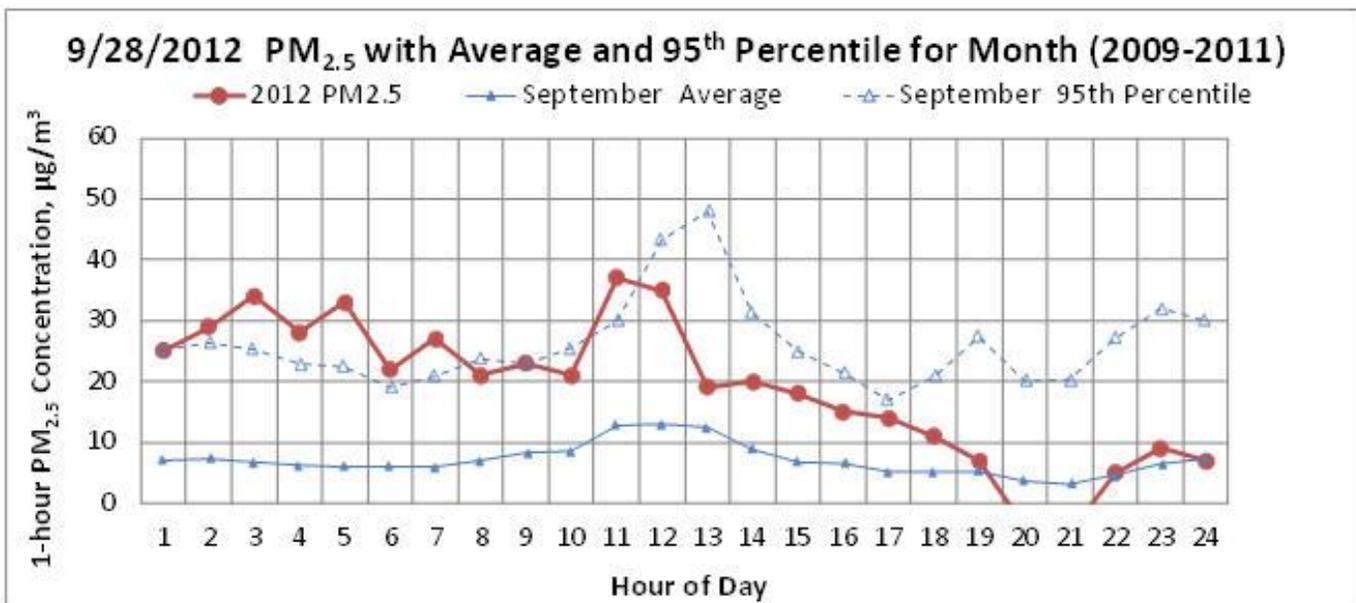




September 28, 2012

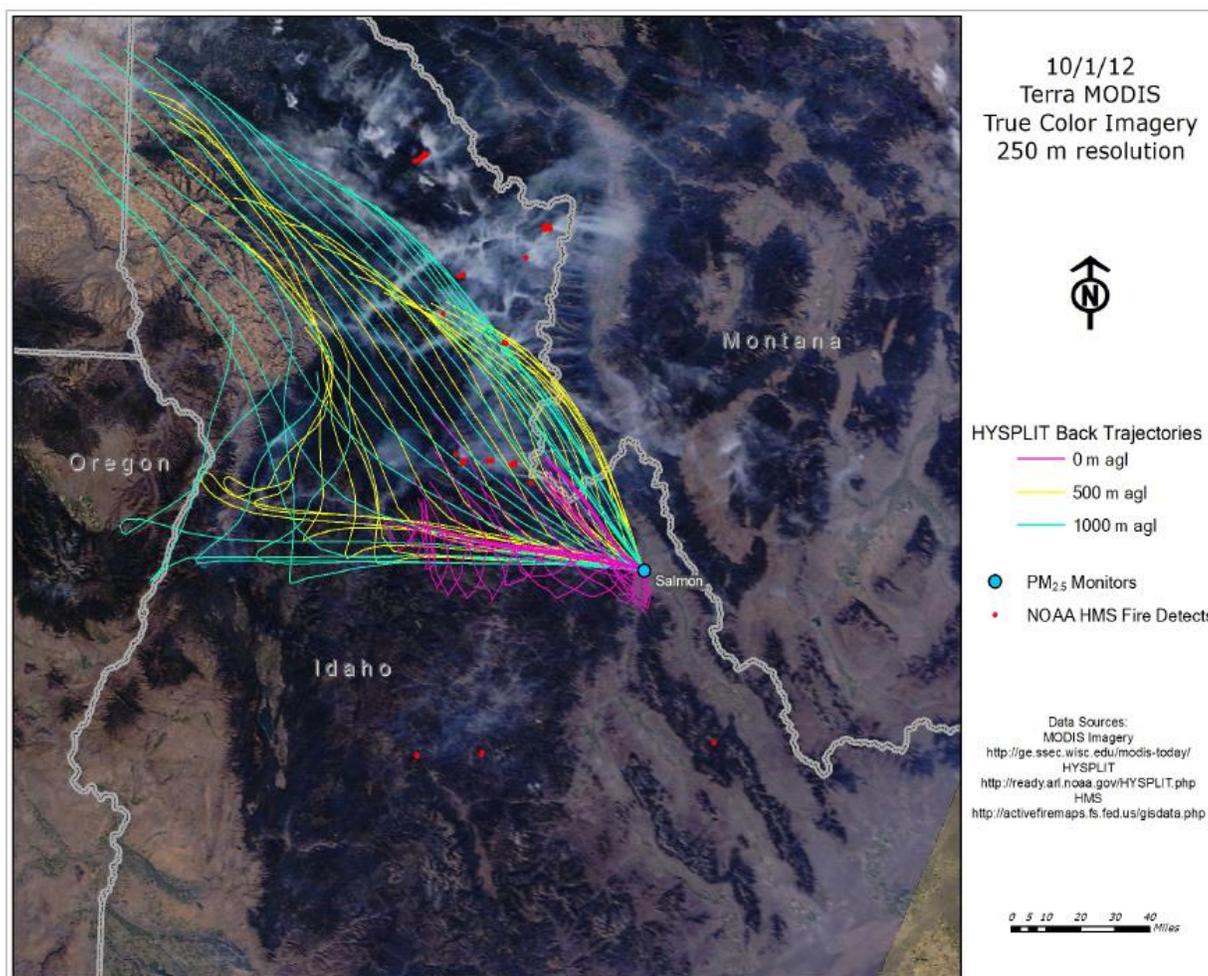
Summary of EER Evidence for Salmon Monitor Value, 20 µg/m ³ on 9-28-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	97 th percentile seasonally; 88 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1 (See Sec. 4)
	Weather Conditions:	Extremely weak pressure gradients (O: 1mb/175mi) again allow local mechanical dynamics to dominate. Transport from the west.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image and previous day afternoon image shows smoke to the north of Salmon with morning PM _{2.5} concentrations above 95 th percentile hourly values. Back trajectories intersect no visible smoke and/or fire detects. Hourly trace shows concentrations above historical 95 th percentile September hourly values for 9 morning hours, then trending down through the day, with a spike at 1100 and 1200.
	Alternative Hypotheses:	Stage 1 Forecast and Caution prohibits all open burning. Temp dips to 35 - 40F range but no evening PM suggests very little RWC. See Sec 4.
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 µg/m ³ (Avg-to-95%tile), thus, this event contributed 4.1 to 14.2 µg/m ³ and we conclude that there may not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	Stage 1 Forecast and Caution in effect, advised residents of protective actions.

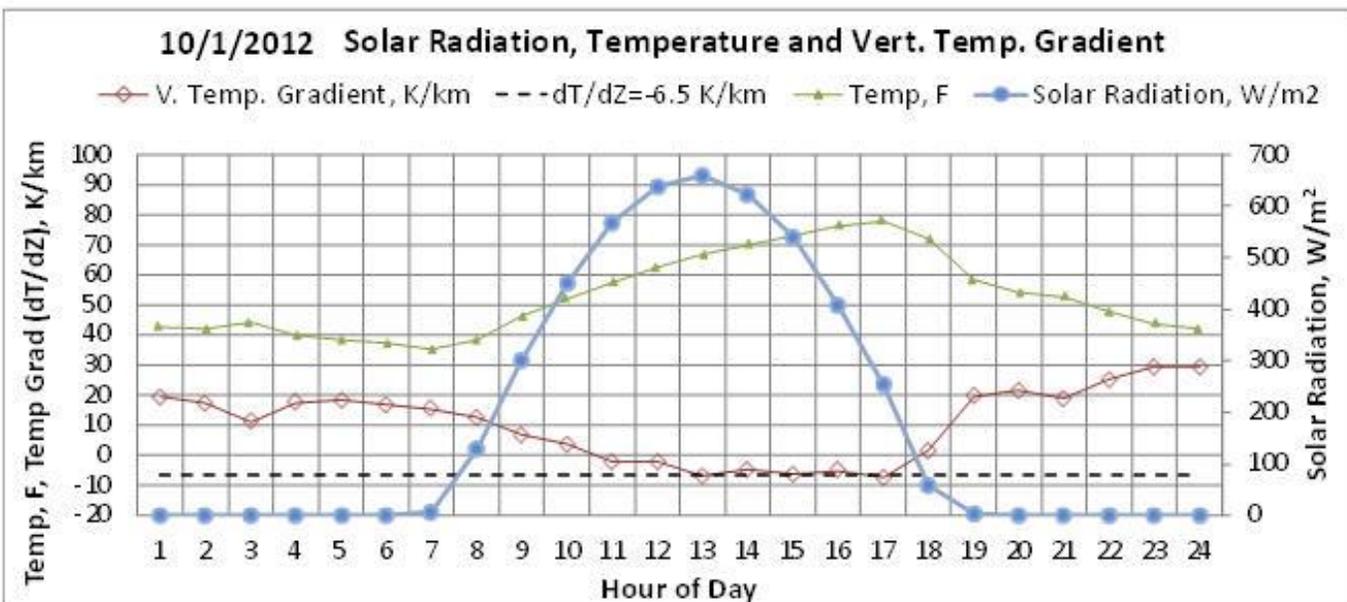
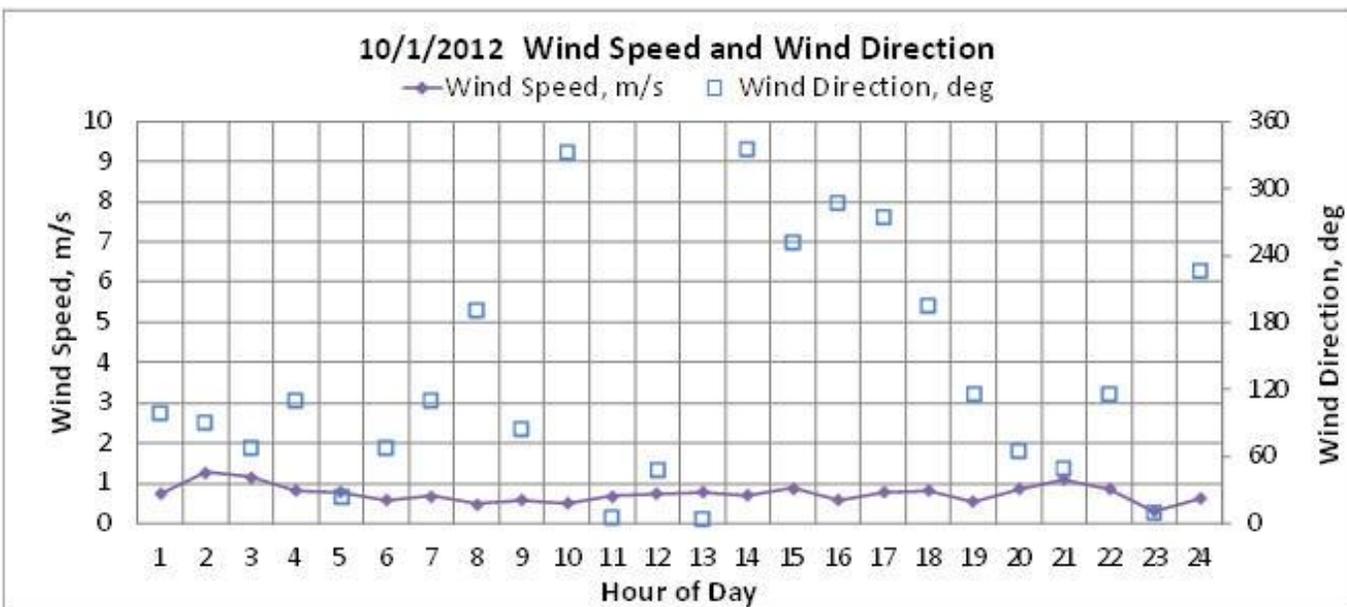
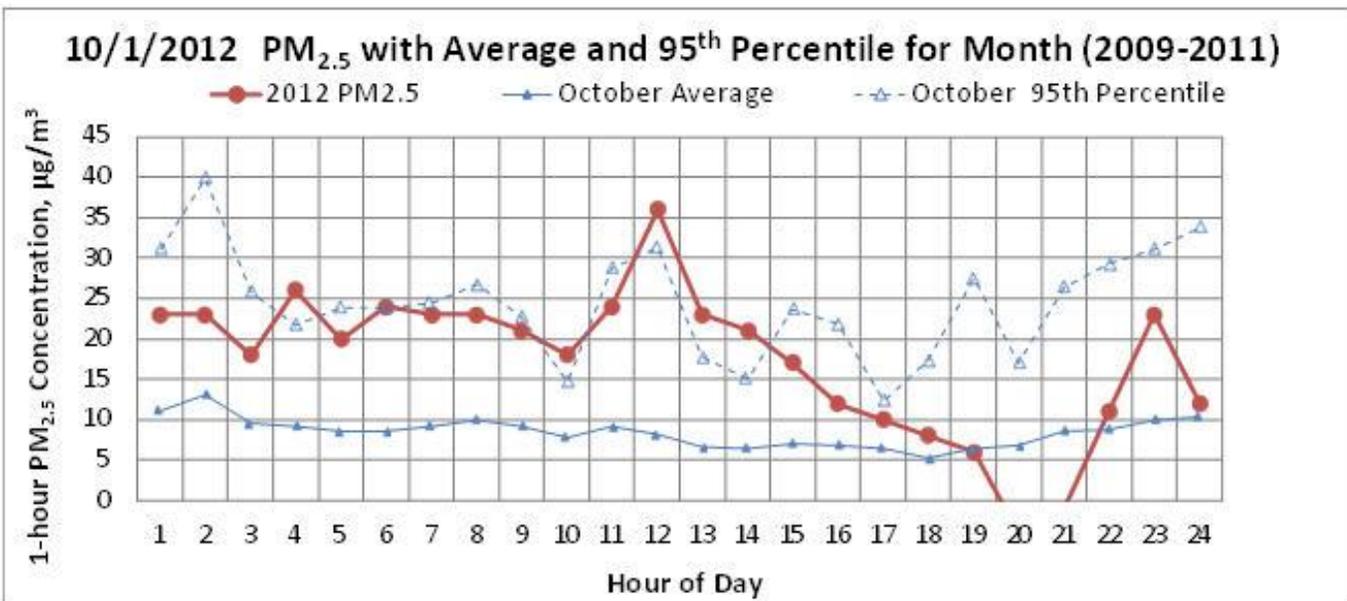




October 1, 2012

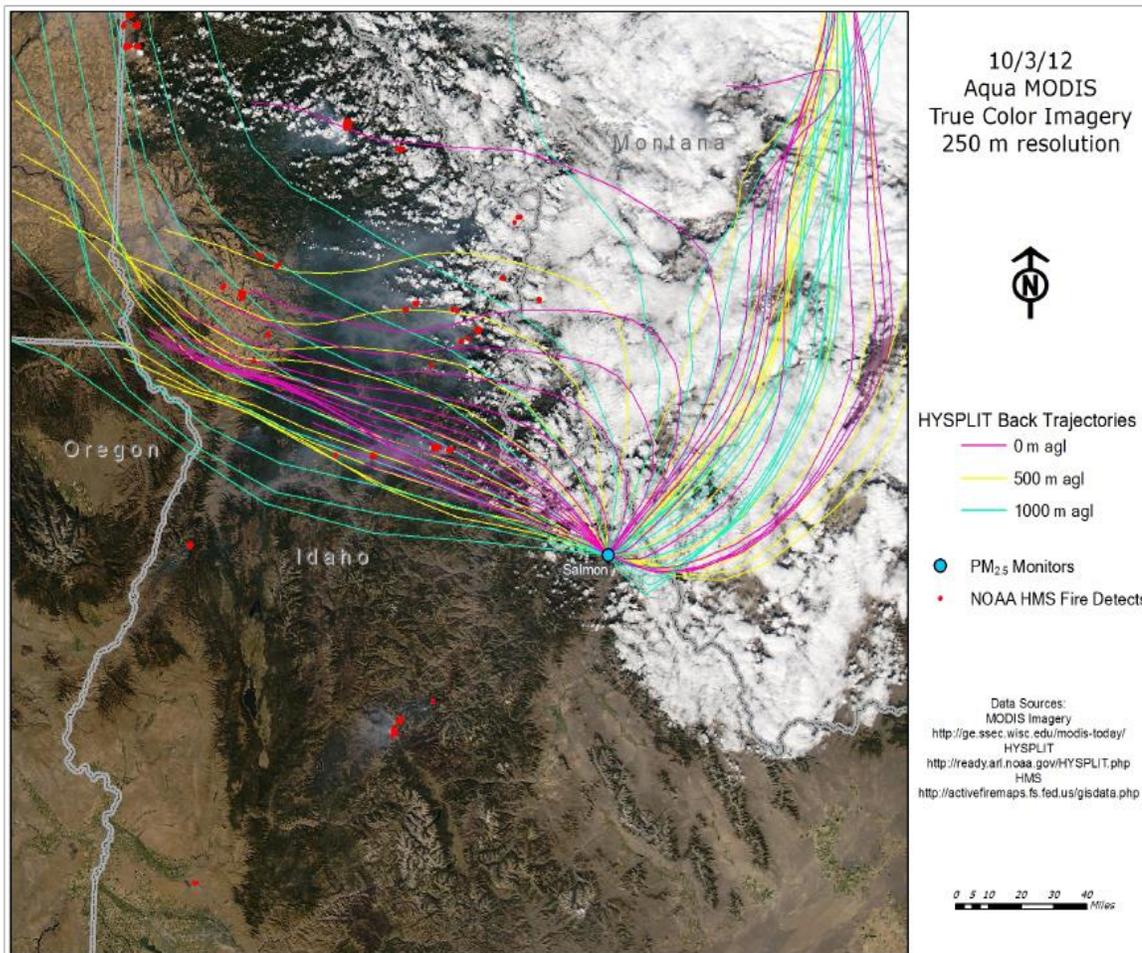
Summary of EER Evidence for Salmon Monitor Value, 18.2 $\mu\text{g}/\text{m}^3$ on 10-1-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	97 th percentile seasonally; 86 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2, 5 (See Sec. 4)
	Weather Conditions:	High pressure builds off the OR coast and Low over Arkansas provides steering aloft for northwesterly flow over Idaho.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows smoke trapped in valleys to the north of Salmon. Back trajectories intersect visible smoke and/or fire detects from Mustang, McGuire, Powell, Sheep, and Wenatchee (WA) fires. Hourly trace shows 6 hourly PM _{2.5} concentrations at or above historical October 95 th percentile hourly levels (~ 20-25 $\mu\text{g}/\text{m}^3$) until 1400 with a spike at noon above 35 $\mu\text{g}/\text{m}^3$.
	Alternative Hypotheses:	Stage 1 Forecast and Caution prohibits all open burning. Evening Temps >40F so RWC contribution should be limited. See Sec 4.
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 2.3 to 12.4 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	Stage 1 Forecast and Caution in effect, advised residents of protective actions.

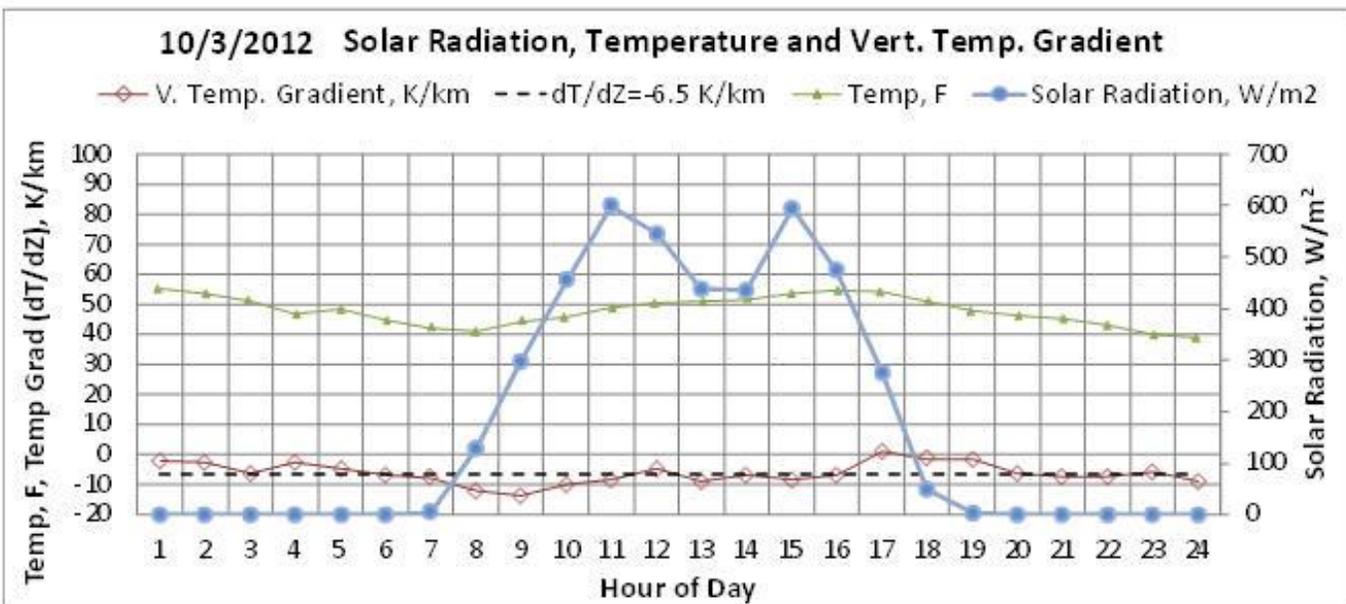
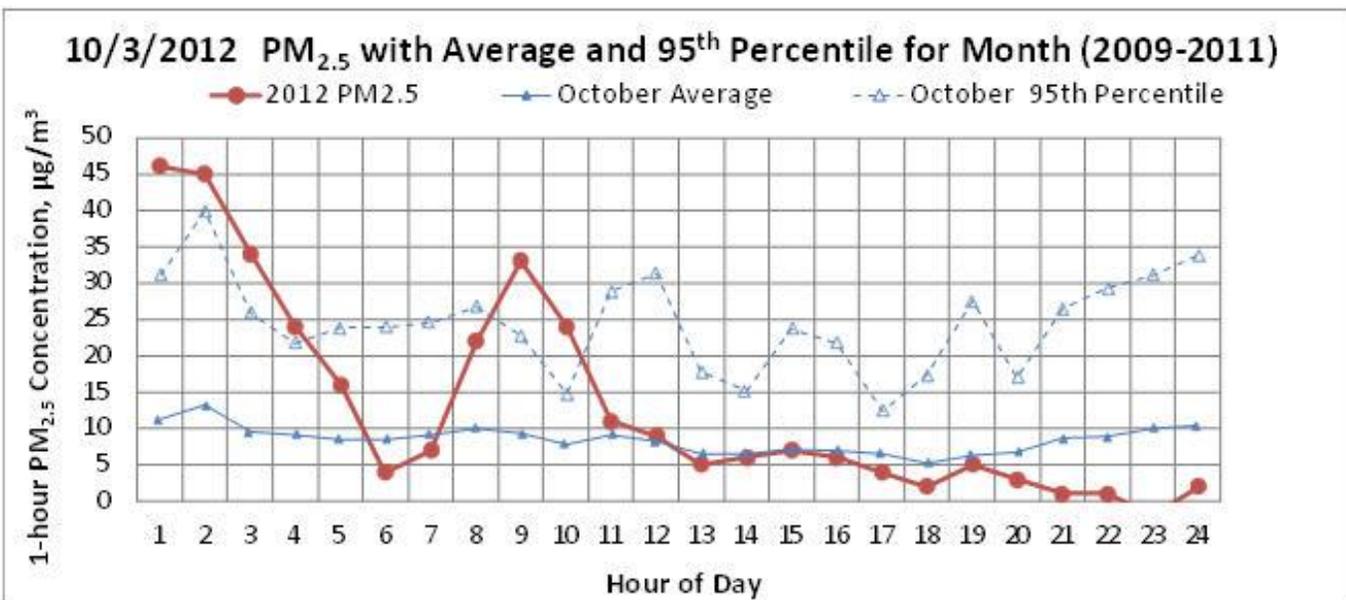




October 3, 2012

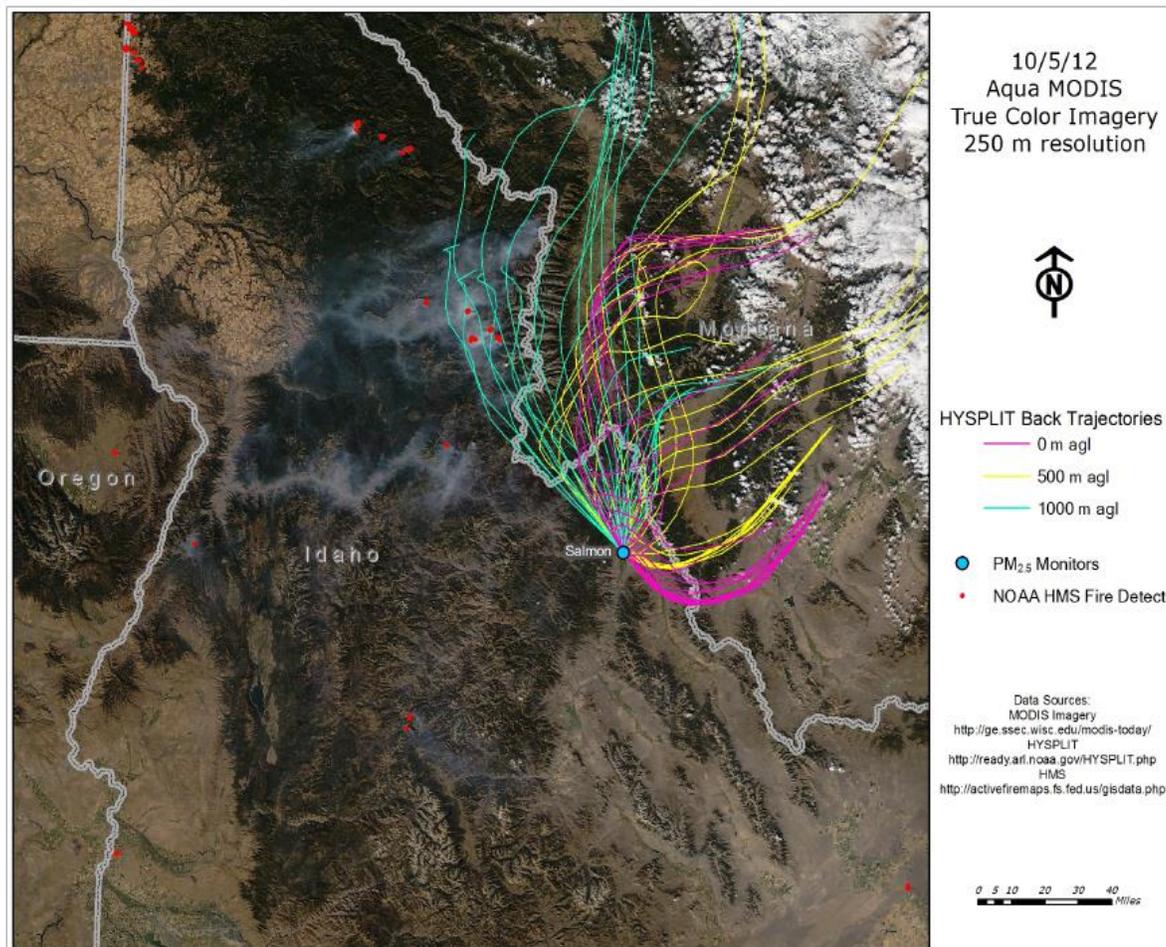
Summary of EER Evidence for Salmon Monitor Value, 14.6 $\mu\text{g}/\text{m}^3$ on 10-3-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	93 rd percentile seasonally; 80 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2, 5 (See Sec. 4)
	Weather Conditions:	Early morning west-northwest flow over the region provides influx while afternoon northerly flow provides clearing.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows light smoke northwest of Salmon. Back trajectories intersect visible smoke and/or fire detects from Mustang, McGuire, and Powell wildfires. Hourly trace shows two PM _{2.5} spikes totalling 6 hours above the historical October hourly 95 th percentile levels in the morning with clearing in the afternoon.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temp >40F, RWC limited. (See Sec 4).
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 0.0 to 8.8 $\mu\text{g}/\text{m}^3$ and we conclude that there may not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	DEQ issued air quality forecast which included appropriate health messaging.

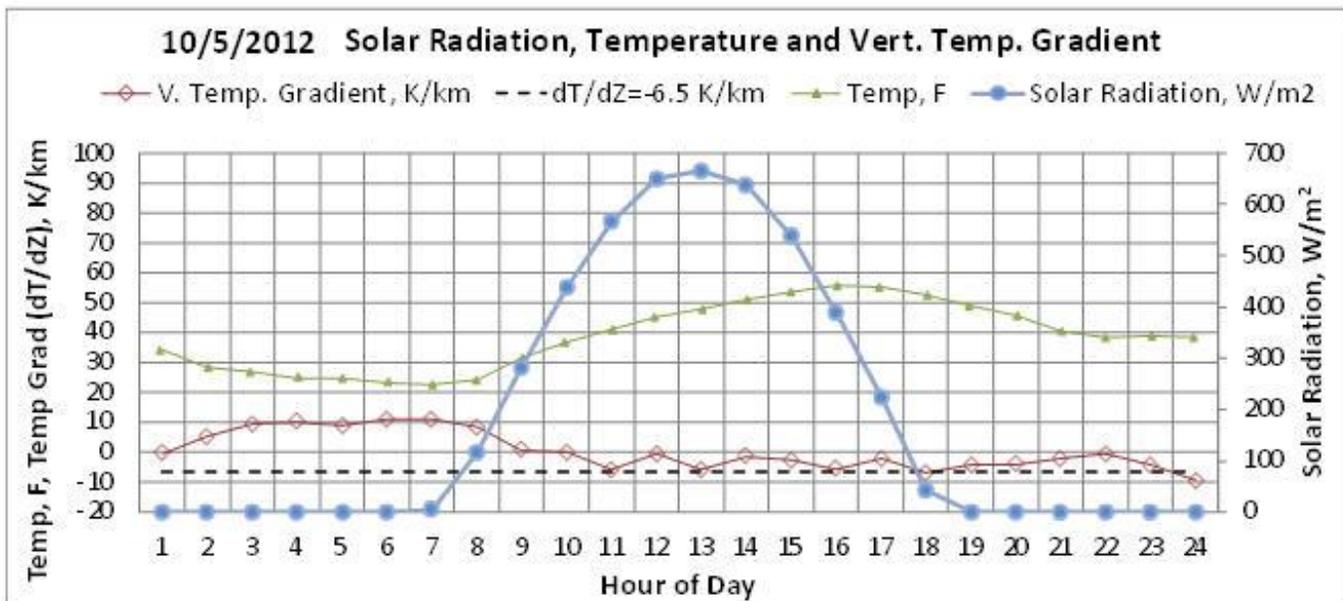
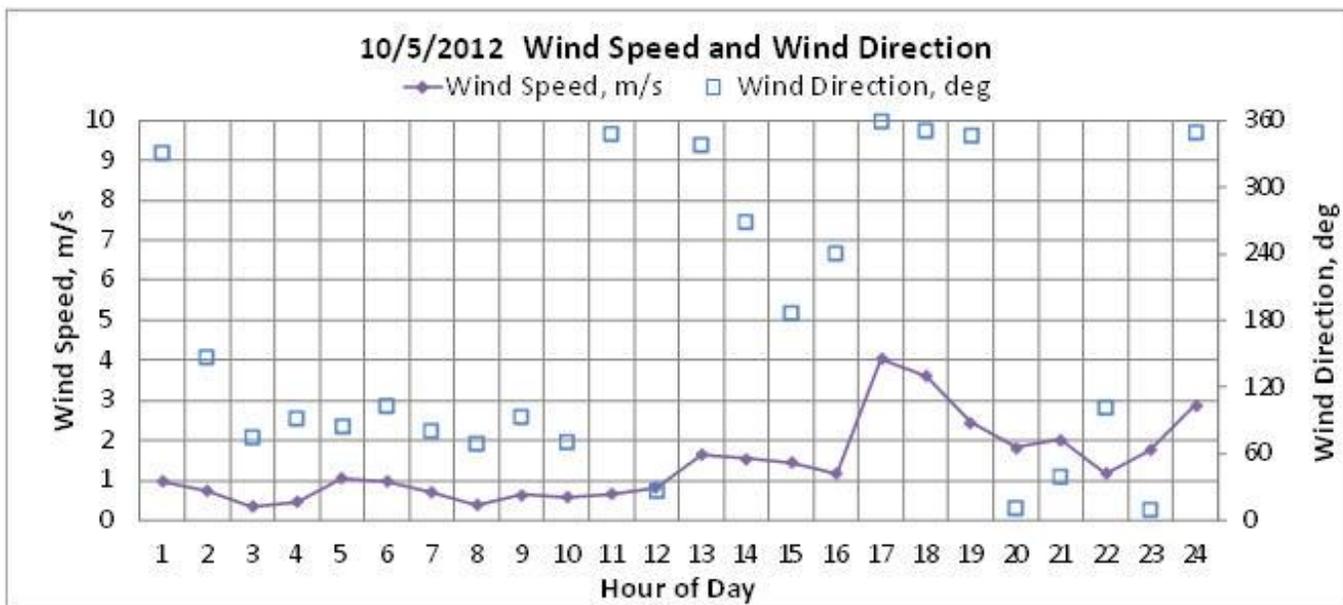
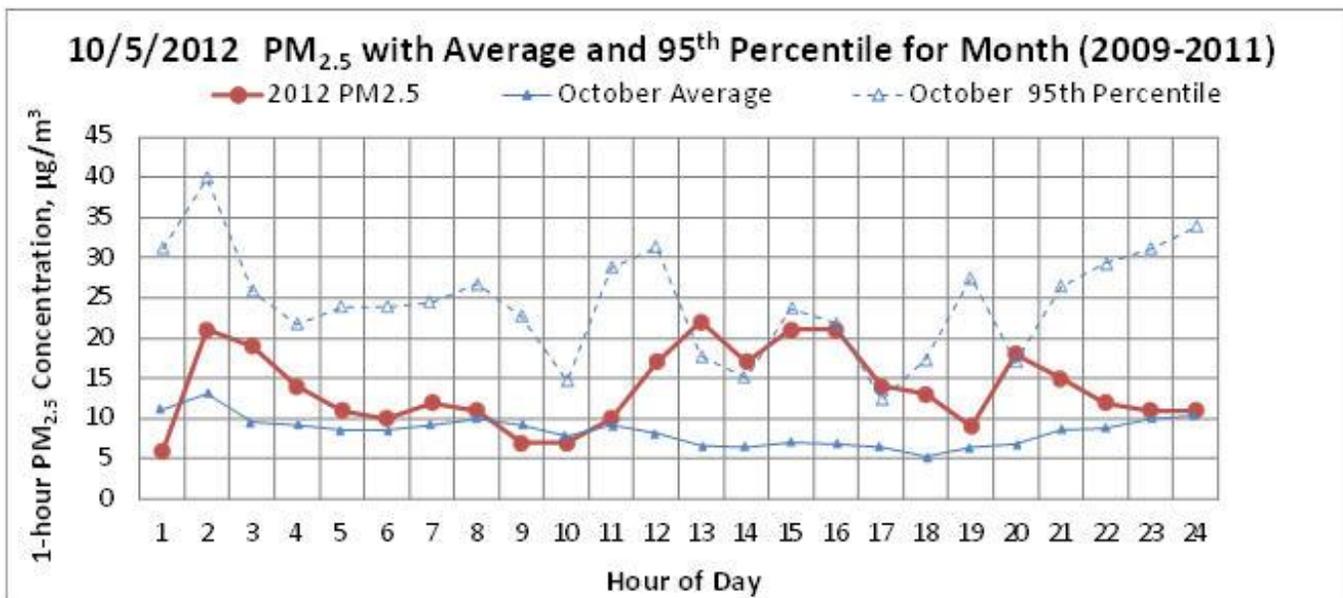




October 5, 2012

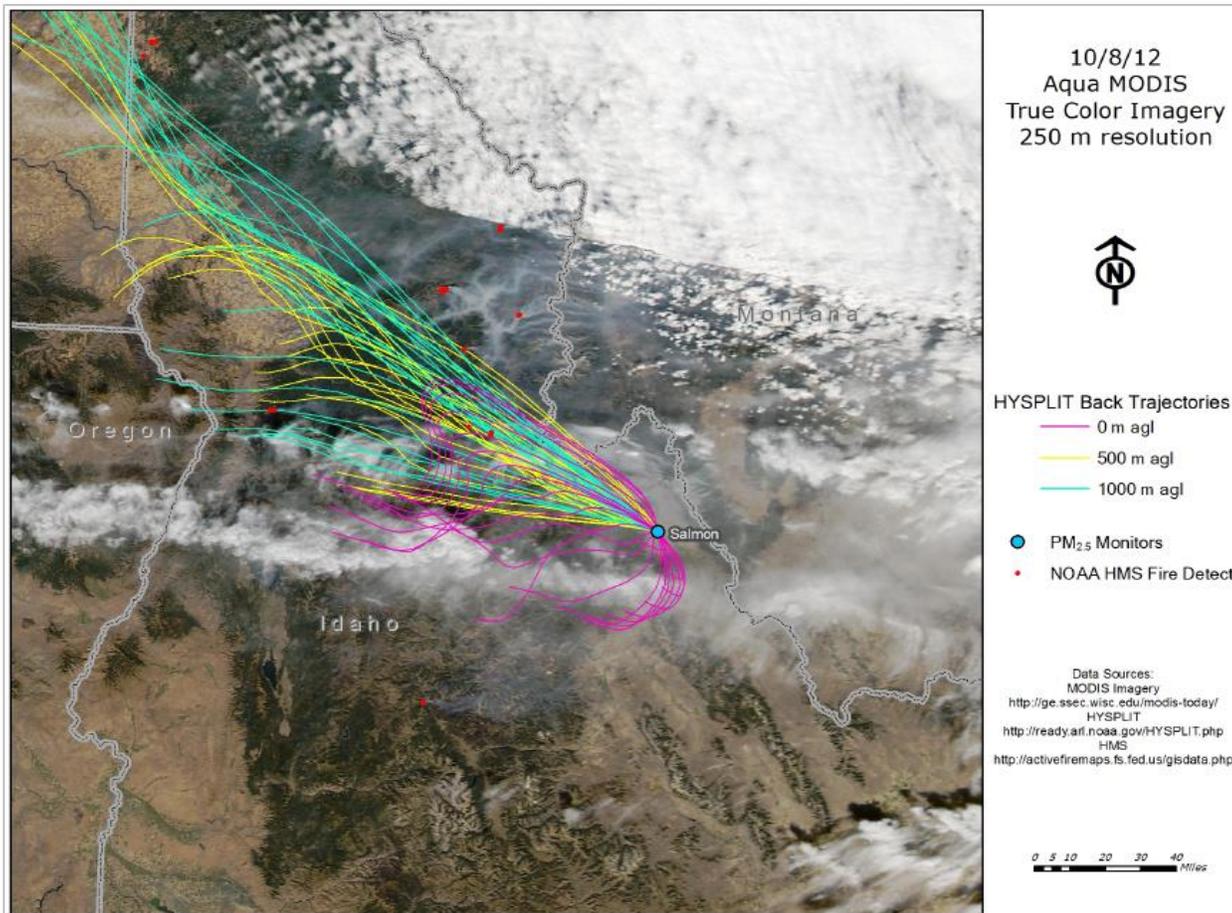
Summary of EER Evidence for Salmon Monitor Value, 13.5 µg/m ³ on 10-5-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	93 rd percentile seasonally; 77 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2 (See Sec. 4)
	Weather Conditions:	Weak baroclinic trough steers winds from the north while surface terrain steers low level winds.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows smoke visible across the neck of Idaho. Back trajectories intersect visible smoke and/or fire detects from Powell SBW Complex. Hourly trace shows variable concentrations mostly between the hourly average and 95 th percentile for October historical data, with 5 hours at or above the 95 th percentile trace.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temps drop to low 20s overnight but evening/night peaks typical of RWC are not present. See Sec 4.
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 µg/m ³ (Avg-to-95%tile), thus, this event contributed 0.0 to 7.7 µg/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 D	DEQ issued air quality forecast which included appropriate health messaging.

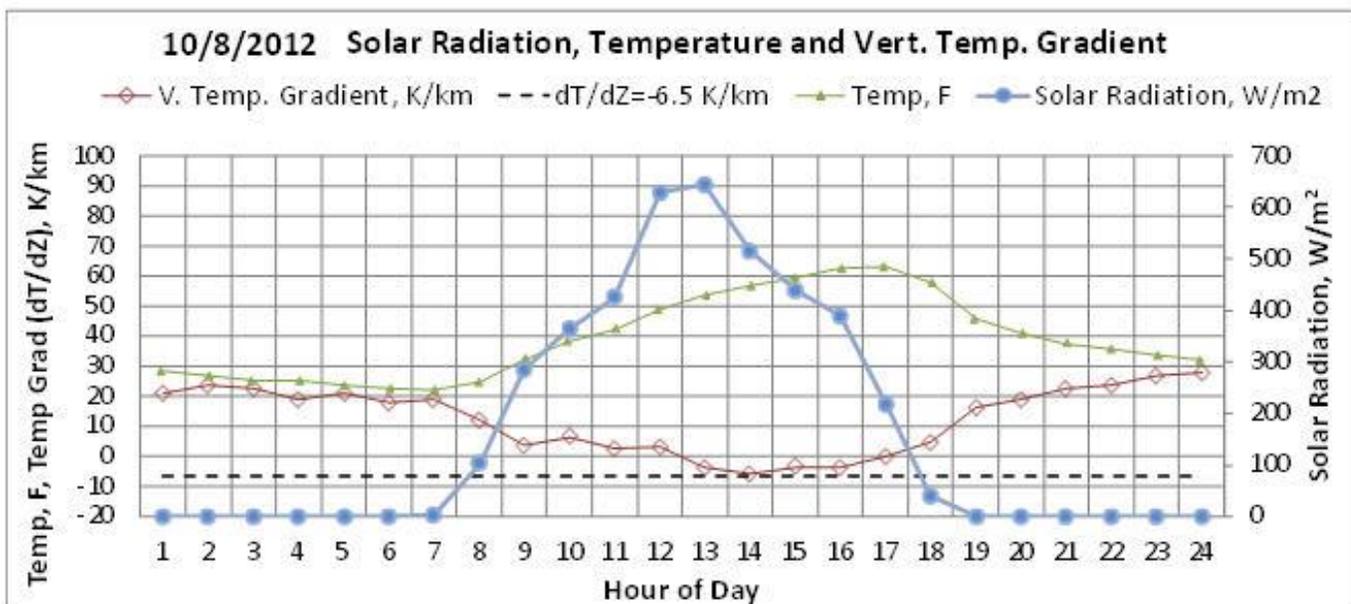
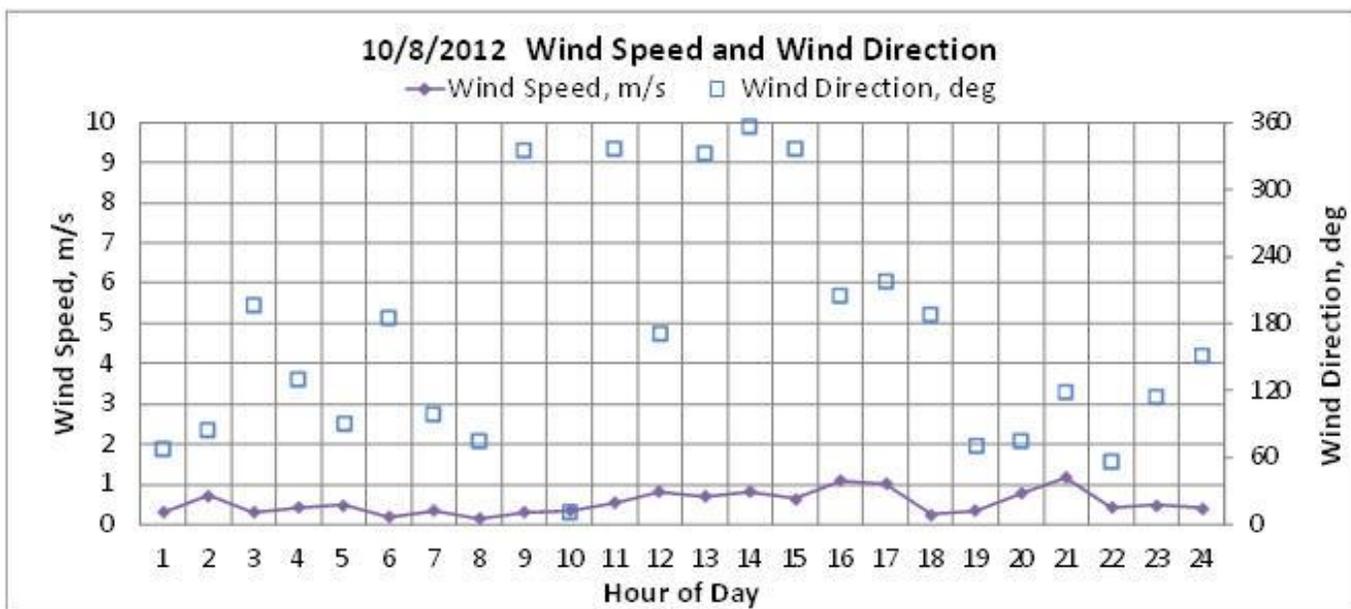
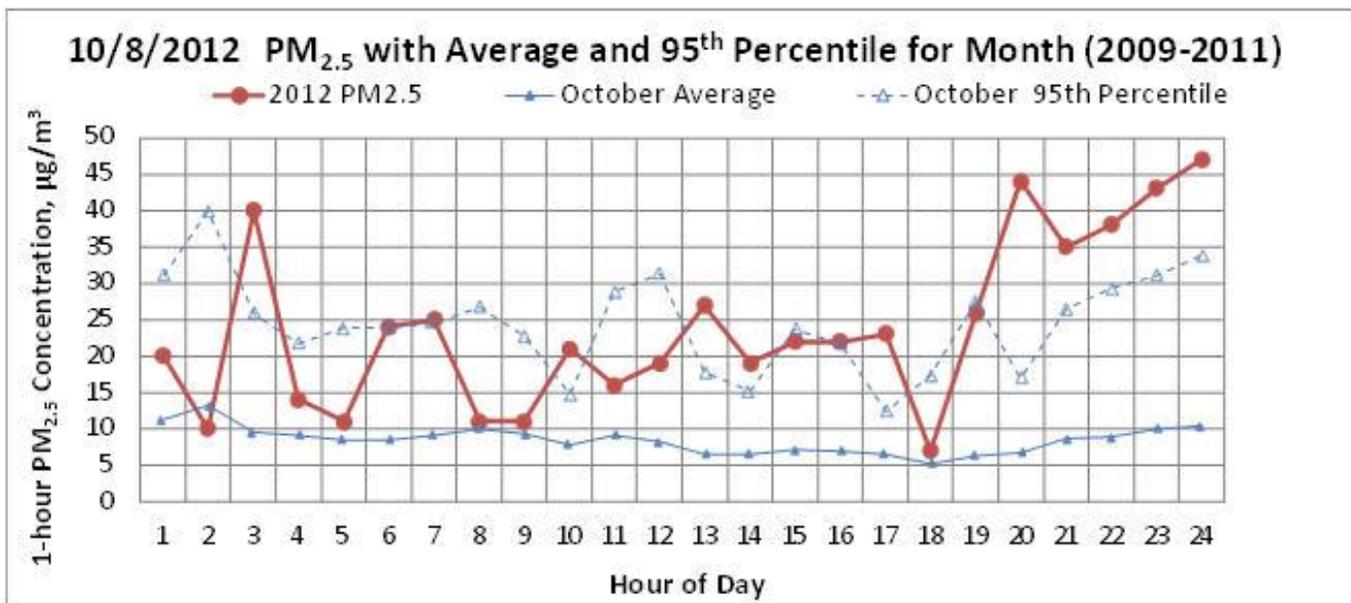




October 8, 2012

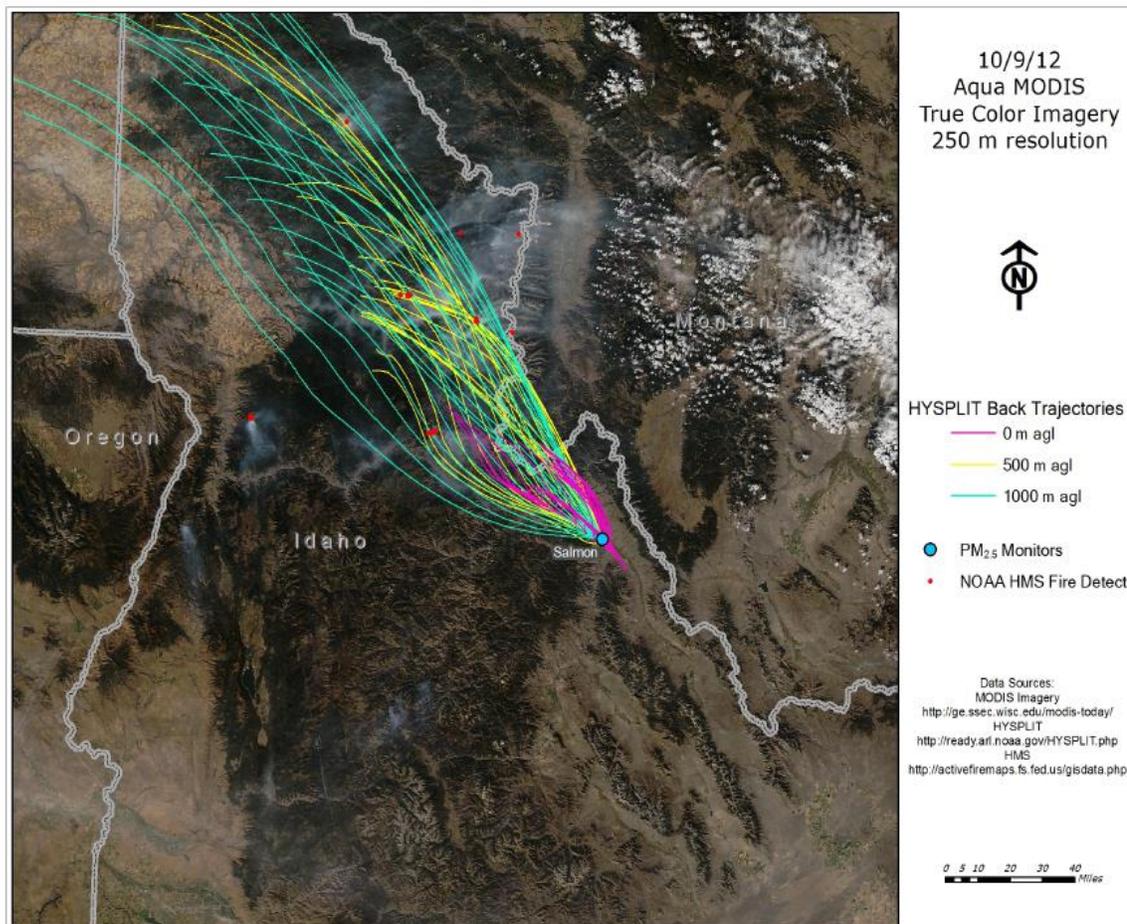
Summary of EER Evidence for Salmon Monitor Value, 22.8 µg/m ³ on 10-8-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	98 th percentile seasonally; 90 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2, 3, 5 (See Sec. 4)
	Weather Conditions:	Weak convergence over ID out of Rex block over E. Pacific brings slight northwest component from highly amplified ridge in the Gulf of Alaska.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows mixed smoke and cloud in the Salmon area. Back trajectories intersect visible smoke and/or fire detects from Mustang, Sheep, McGuire, Halstead, and Powell SBW fires. Hourly trace shows an atypical, spiky morning pattern around 95 th percentile hourly values and a clear upward trend after 1800 well above 95 th percentile. Thirteen hours are at or above the historical 95 th percentile levels.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temps <30F so some RWC contribution is likely, but satellite images show obvious smoke throughout region. See Sec 4.
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 µg/m ³ (Avg-to-95%tile), thus, this event contributed 6.9 to 17.0 µg/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 D	DEQ issued air quality forecast which included appropriate health messaging.

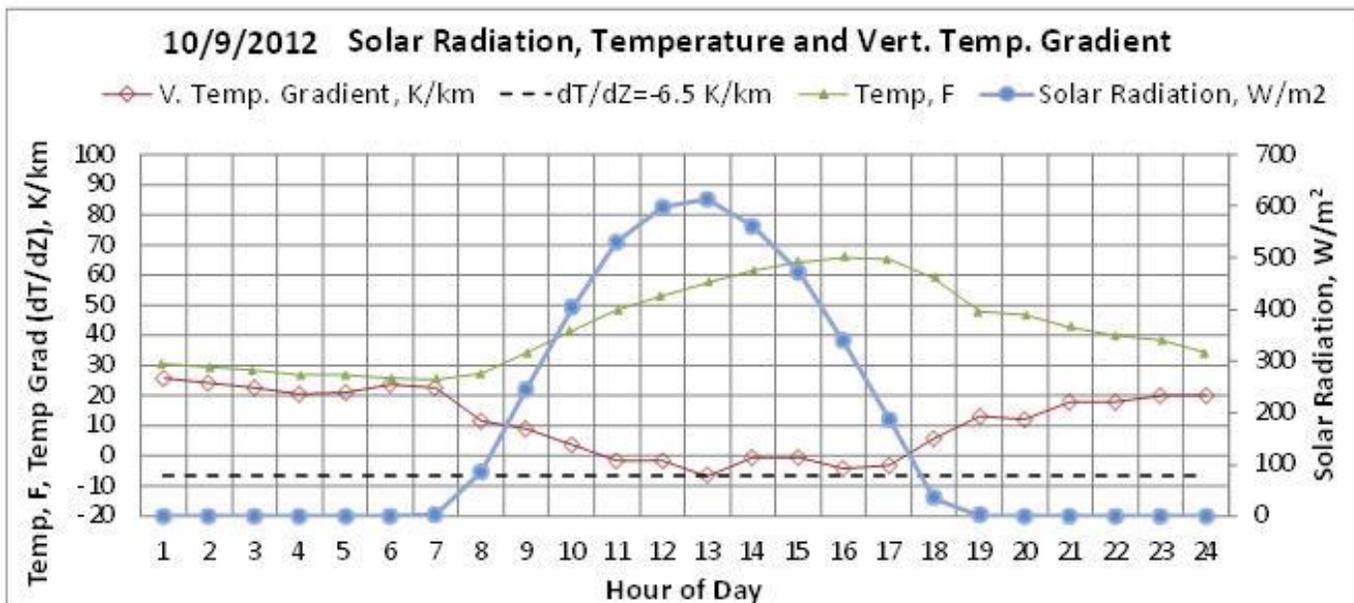
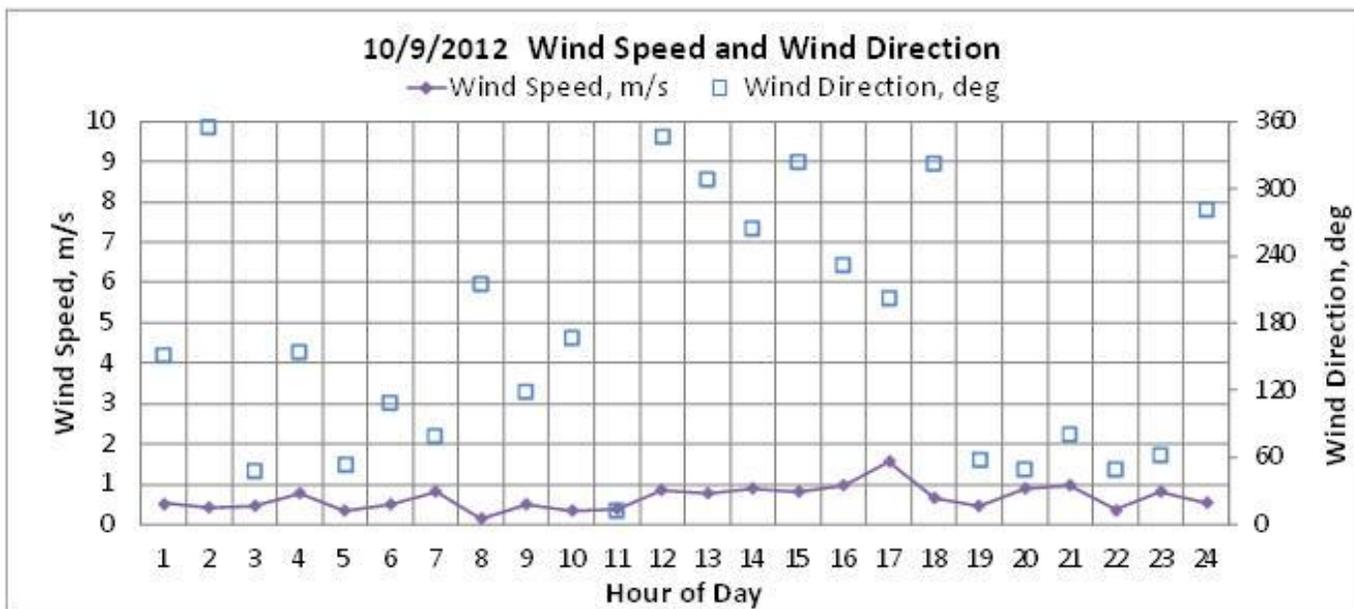
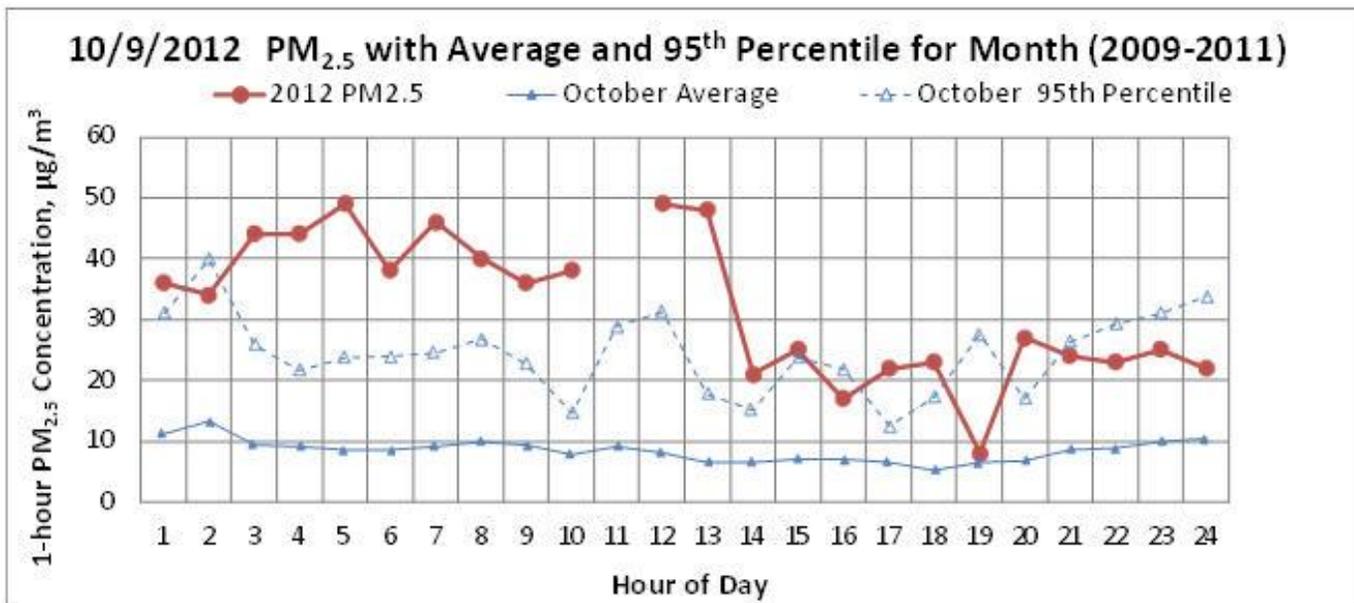




October 9, 2012

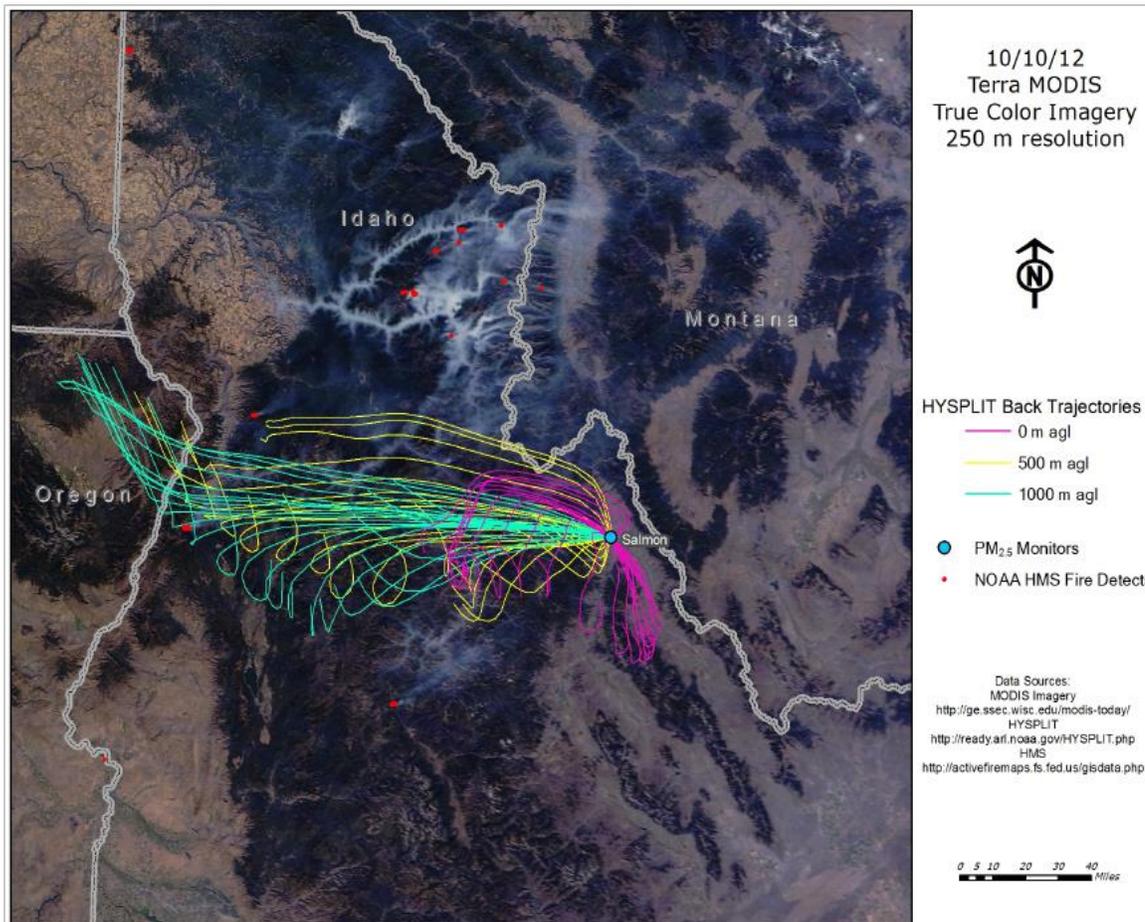
Summary of EER Evidence for Salmon Monitor Value, 33.2 $\mu\text{g}/\text{m}^3$ on 10-9-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; 96 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2, 5 (See Sec. 4)
	Weather Conditions:	Low off shore weakens into open wave and northwest flow from ridge pattern occurs over Idaho.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows visible smoke to the northwest of Salmon. Back trajectories intersect visible smoke and/or fire detects from Mustang and Powell SBW fires. Hourly trace shows higher values in the morning than in the afternoon, well above (~20 $\mu\text{g}/\text{m}^3$ above) hourly 95th percentile values for October. Levels remain above 20 $\mu\text{g}/\text{m}^3$ for most of the day, with PM _{2.5} at or above the 95 th percentile October historical levels for 16 hours.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temps <30F so some RWC contribution is likely, however overnight values are ~20 $\mu\text{g}/\text{m}^3$ above hourly 95 th percentile levels and do not increase in the evening, suggesting RWC is not contributing significantly. See Sec 4.
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 17.3 to 27.4 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	DEQ issued air quality forecast which included appropriate health messaging.



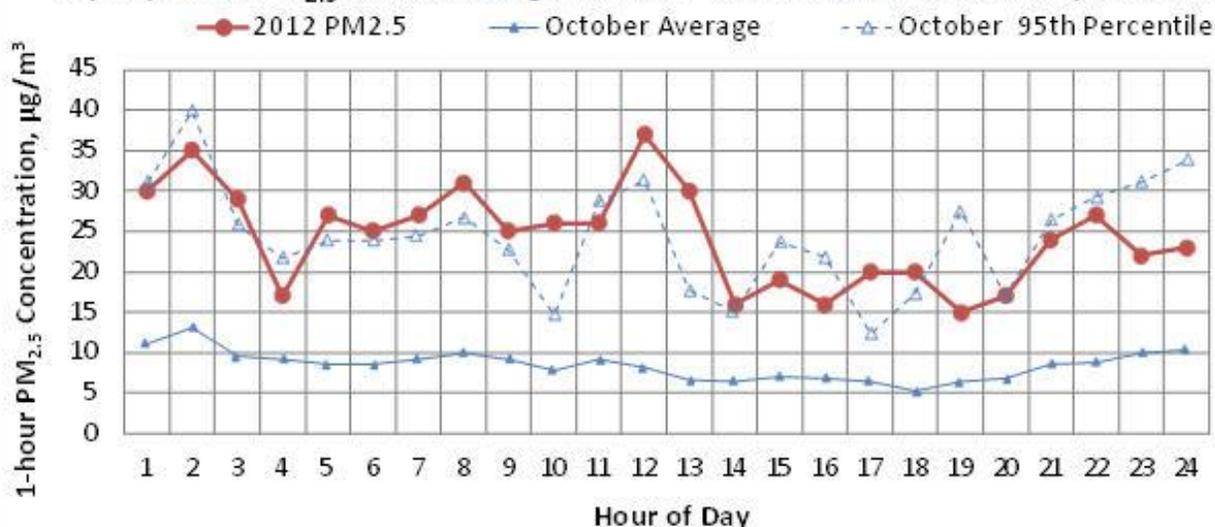


October 10, 2012

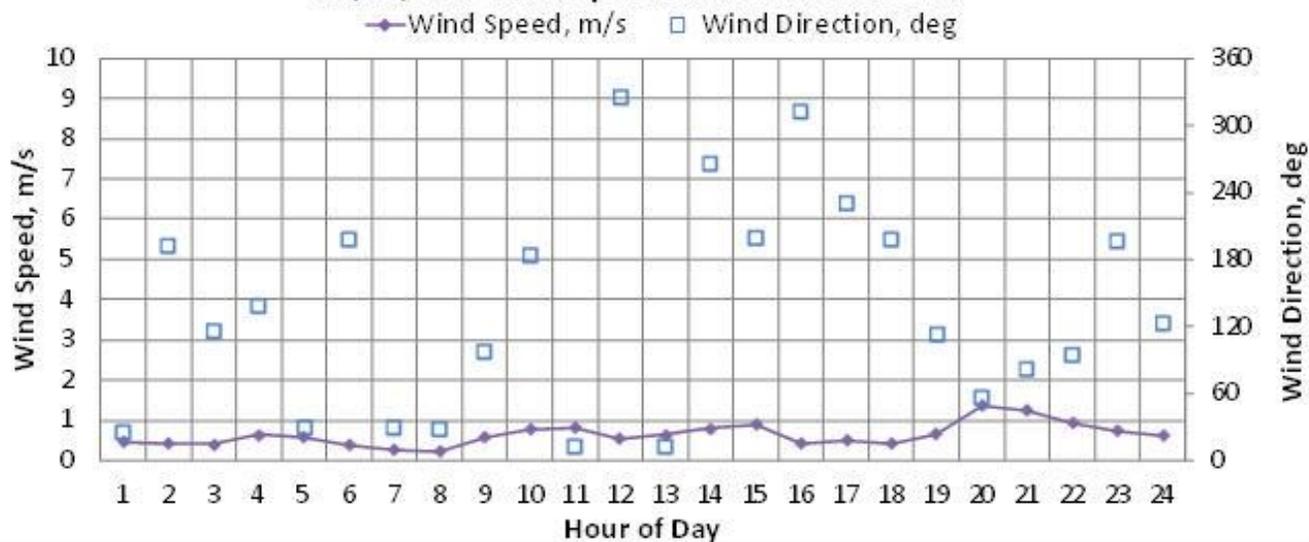
Summary of EER Evidence for Salmon Monitor Value, 24.2 $\mu\text{g}/\text{m}^3$ on 10-10-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; 91 st percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2, 5 (See Sec. 4)
	Weather Conditions:	Low tracks on shore and provides westerly flow over Idaho with weak pressure gradients aloft over the region.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Morning satellite image shows visible smoke sunk in the drainages to the northwest of Salmon and north end of Salmon valley. Back trajectories intersect visible smoke and/or fire detects from Mustang, Sheep, Wesley and Halstead fires. Hourly trace shows concentrations between 15 and 37 $\mu\text{g}/\text{m}^3$ all day. Thirteen hours are near or above the 95 th percentile hourly values.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temperatures around freezing so some RWC contribution is possible. See Sec 4.
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 8.3 to 18.4 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	DEQ issued air quality forecast which included appropriate health messaging.



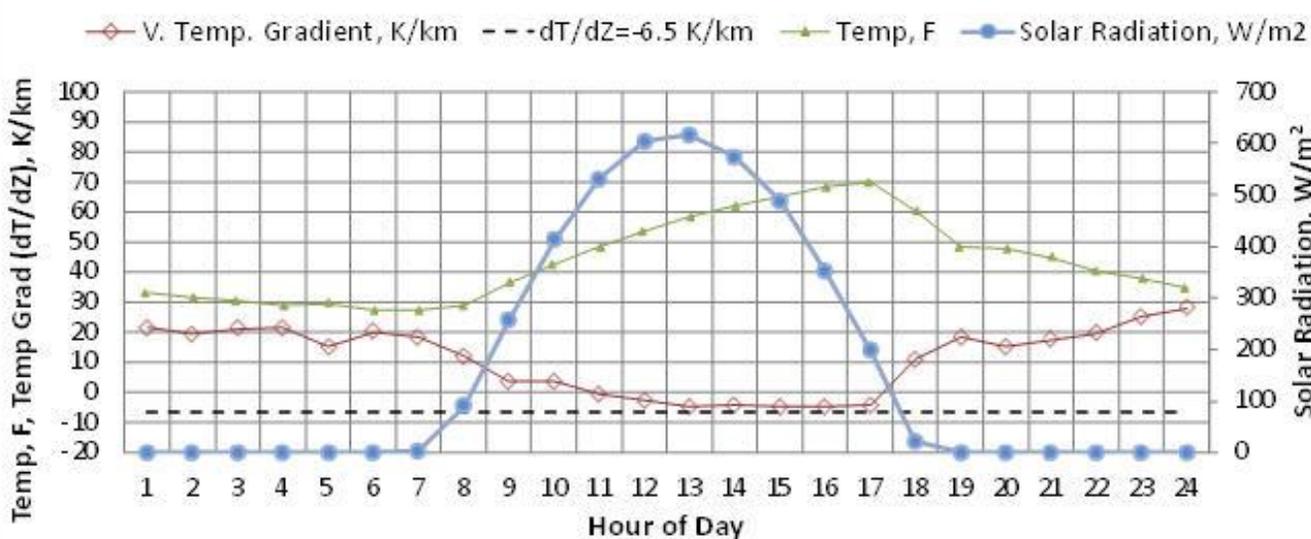
10/10/2012 PM_{2.5} with Average and 95th Percentile for Month (2009-2011)



10/10/2011: Wind Speed and Wind Direction

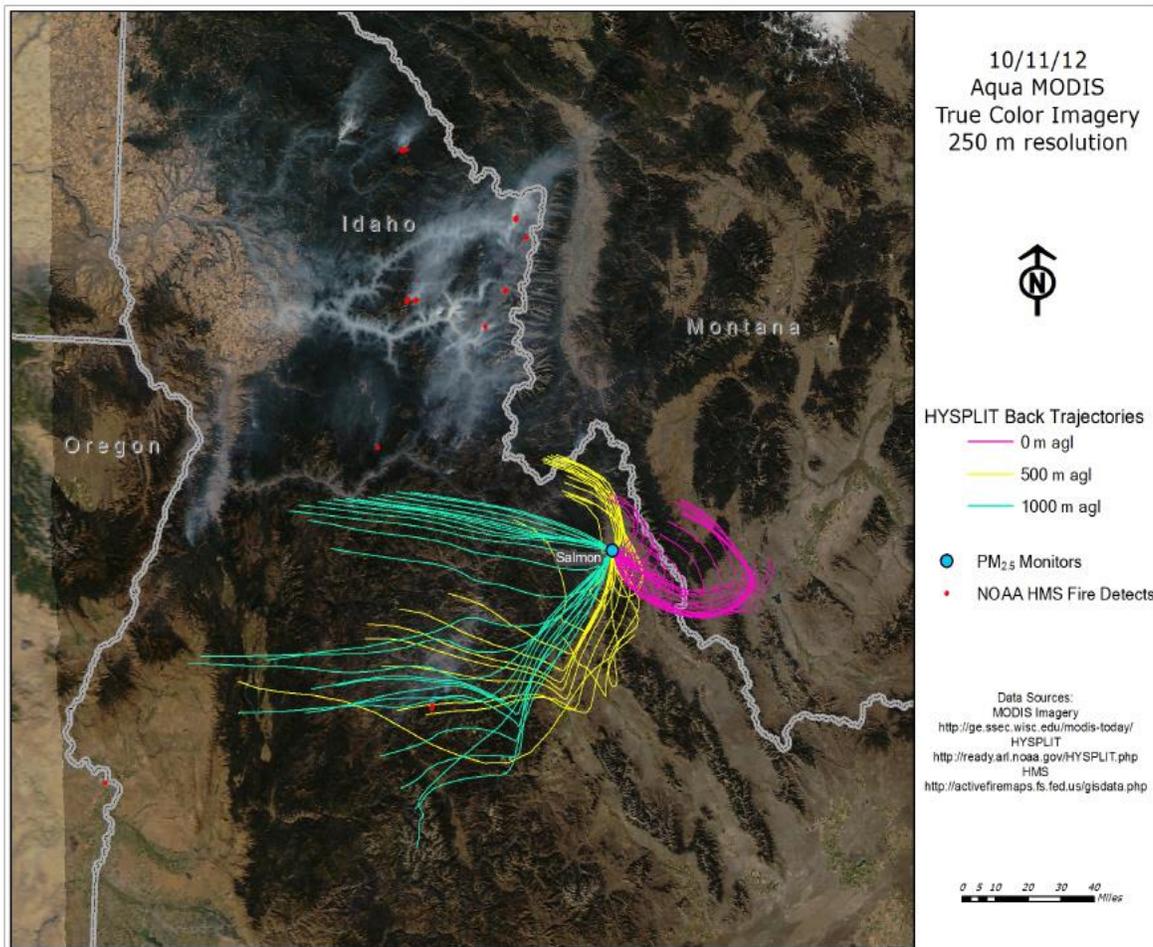


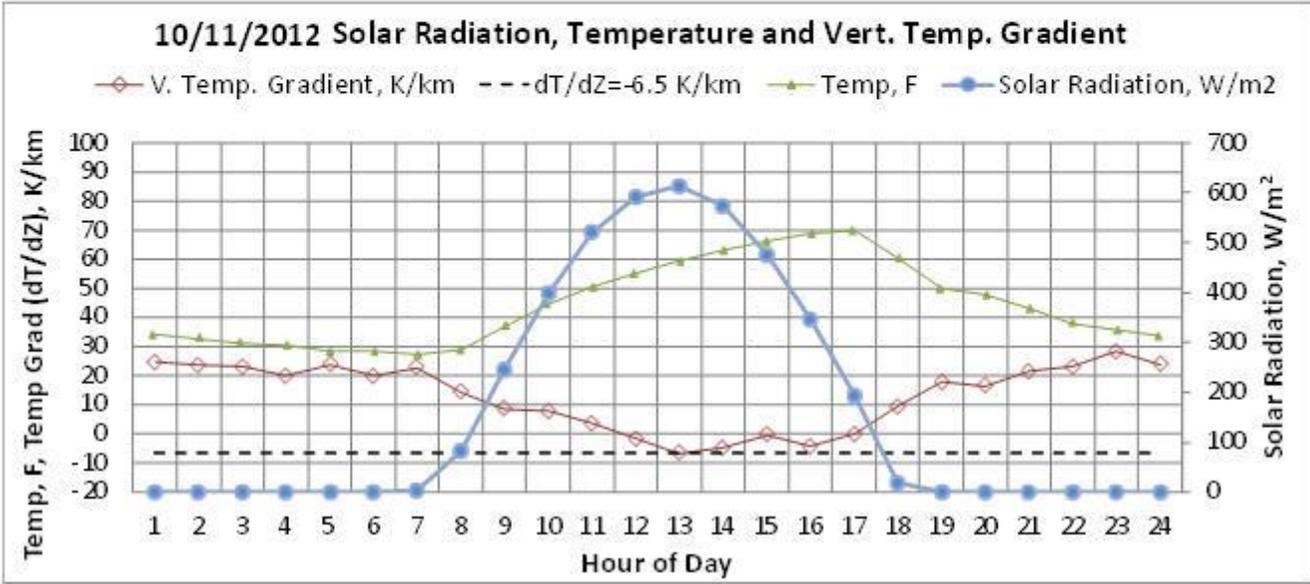
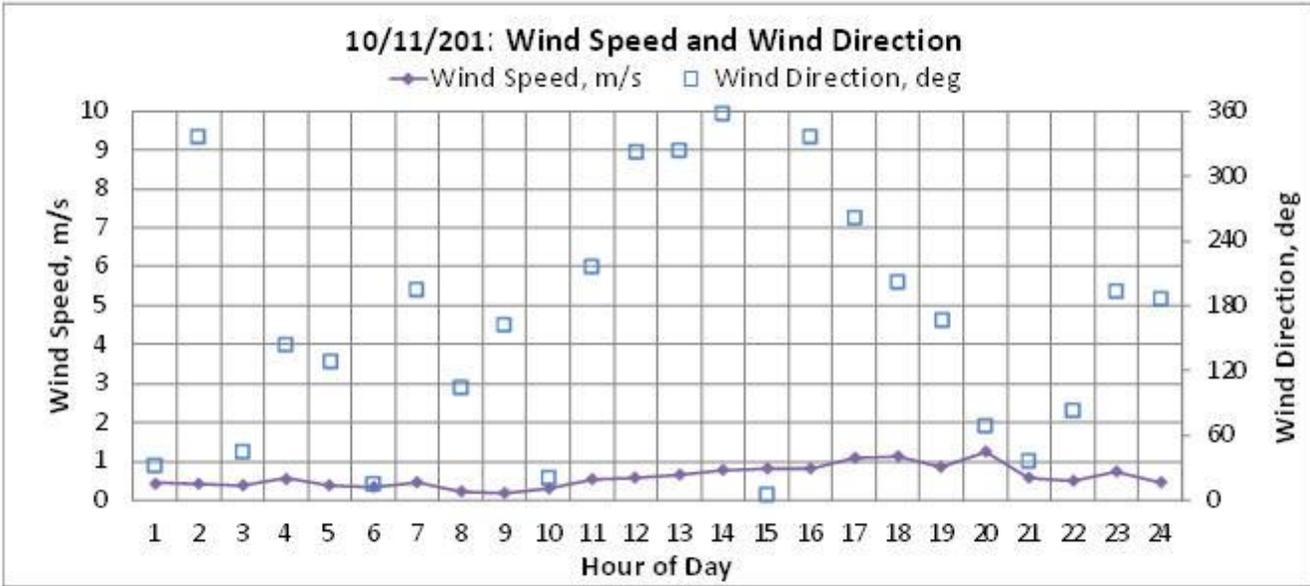
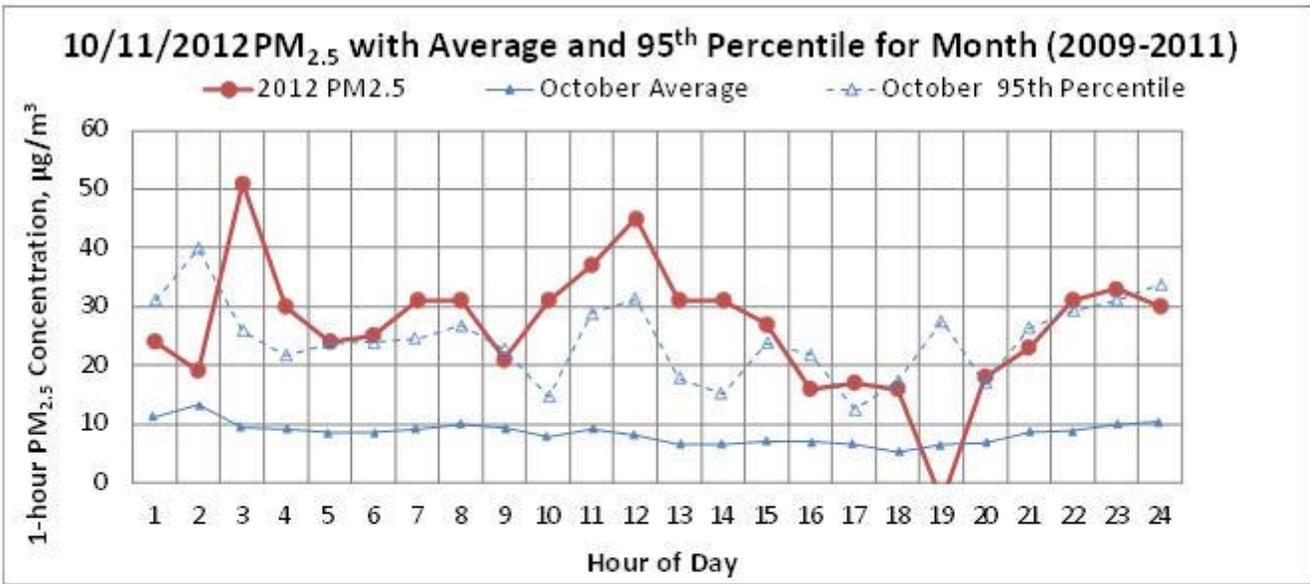
10/10/2012 Solar Radiation, Temperature and Vert. Temp. Gradient



October 11, 2012

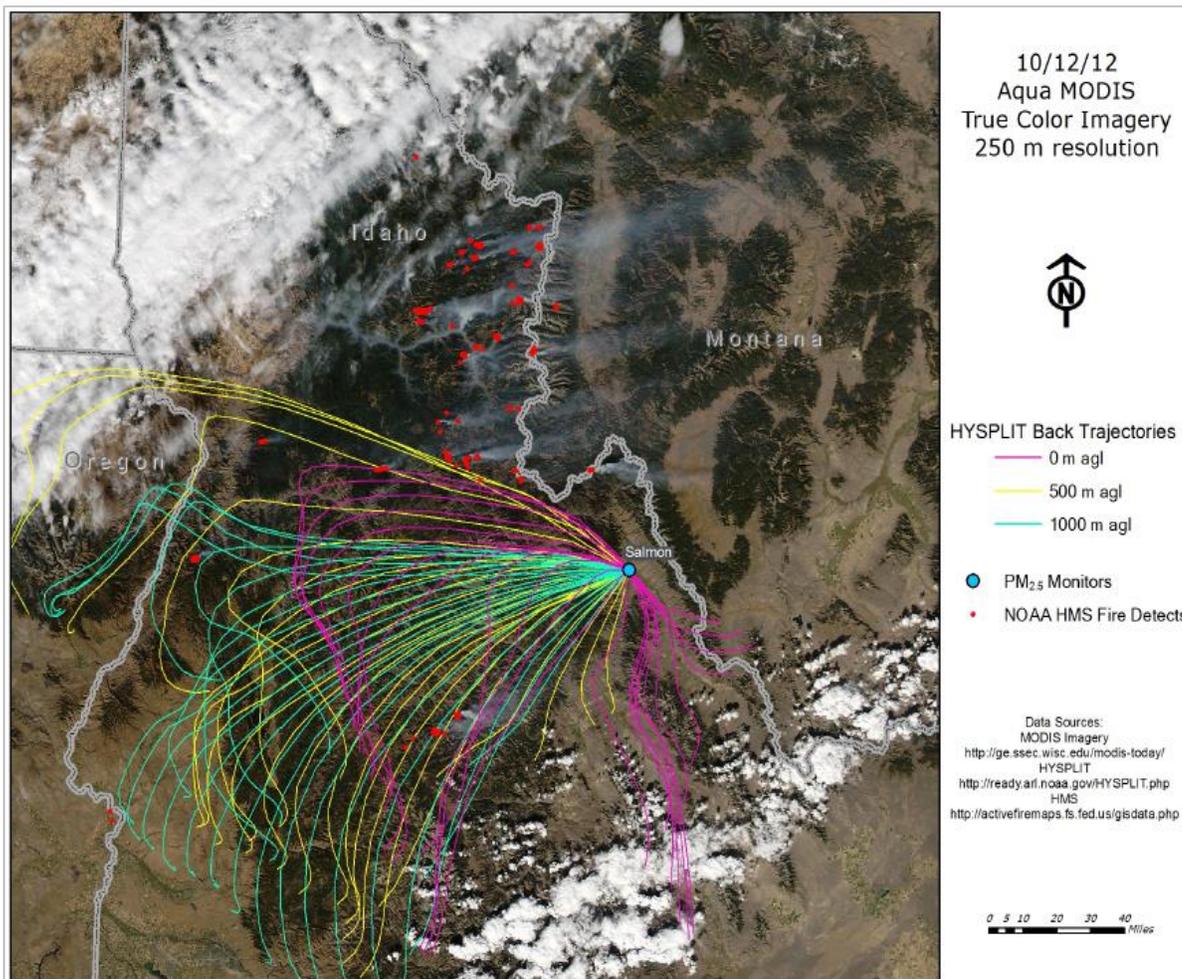
Summary of EER Evidence for Salmon Monitor Value, 26.3 $\mu\text{g}/\text{m}^3$ on 10-11-2012, AQS #16-059-0004 POC 3		
(No additional Monitor Values were recorded on this day)		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	>99 th percentile seasonally; 93 rd percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 4 (See Sec. 4)
	Weather Conditions:	Low tracks to the south and winds shift to meridional along the ID/OR border with weak southerly flow as flow converges across the UT/WY/ID border.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows that smoke remains visible to the northwest and southwest of Salmon. Back trajectories intersect visible smoke and/or fire detects from the Halstead fire. Hourly trace shows an early morning spike; concentrations remain above 20 $\mu\text{g}/\text{m}^3$ for most of the day, ~ 10 $\mu\text{g}/\text{m}^3$ or more above 95 th percentile for a third of the hours and at or above the 95 th percentile values for 17 hours total.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temperatures around freezing so some RWC contribution is possible. See Sec 4.
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 10.4 to 20.5 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	DEQ issued air quality forecast which included appropriate health messaging.



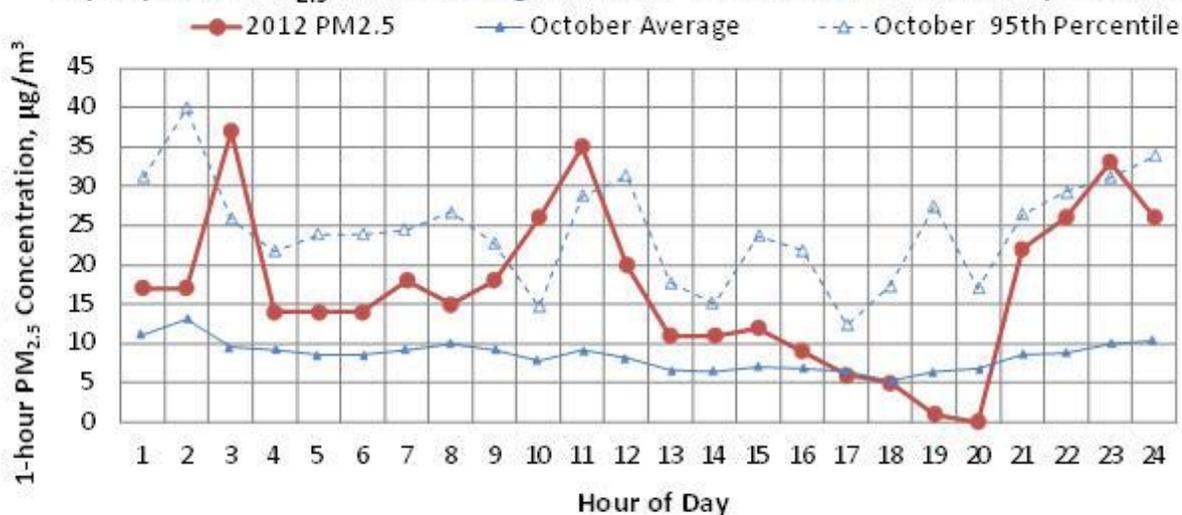


October 12, 2012

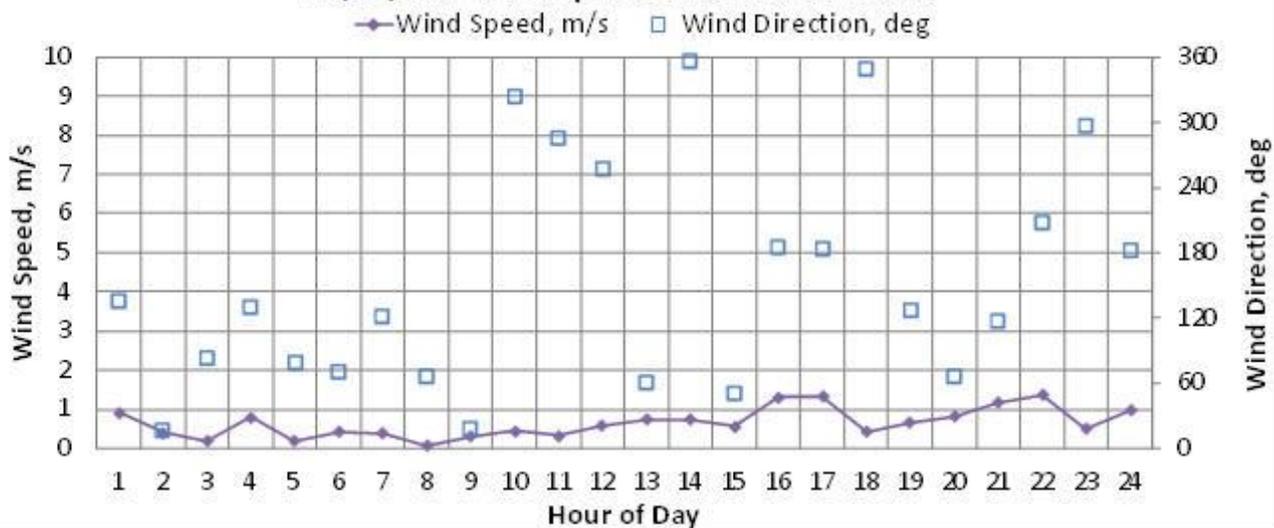
Summary of EER Evidence for Salmon Monitor Value, 17.1 $\mu\text{g}/\text{m}^3$ on 10-12-2012, AQS #16-059-0004 POC 3		
Also included in this request, 24-hour FRM Value (filter based): 14.3 $\mu\text{g}/\text{m}^3$, AQS #16-059-0004 POC 1		
Criterion	Supporting Information	Evidence for this Day
nRCP	Source/Controllability:	Source is wildfires which are not reasonably controllable or preventable (See Sec. 2)
HF	Percentile Rankings:	97 th percentile seasonally; 85 th percentile annually (vs 2008-2011). (See Sec. 3)
CCR	Conceptual Model:	Scenario 1, 2, 4 (See Sec. 4)
	Weather Conditions:	Low progresses over S. NV and flow splits along the ID/OR border and converges well east of the state, limiting wind speeds and providing variable direction.
	Transport Conditions and PM _{2.5} /wind information: (See satellite image w/ back-trajectories and time series).	Afternoon satellite image shows smoke streaming east from fire detects. Back trajectories intersect visible smoke and/or fire detects from Halstead, Mustang, McGuire, Sheep, and Wesley fires. Smoke plume is visible across north end of Salmon Valley. Hourly trace shows an early morning spike; concentrations remain above 20 $\mu\text{g}/\text{m}^3$ for most of the day and above the 95 th percentile for 4 hours.
	Alternative Hypotheses:	No prescribed or crop residue burning occurred in Lemhi Co. Temperatures around freezing so some RWC contribution is possible but likely does not explain the 0300 and 1000 - 1100 spikes above the 95 th percentile. See Sec 4.
	Speciation:	IMPROVE data show carbon PM _{2.5} was elevated from Aug thru Sept (Sec 1.6)
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 criterion is also met.
NEBF	See discussion, Sec. 7 for explanation of NEBF	Normal Fluctuations above the average are 5.8 to 15.9 $\mu\text{g}/\text{m}^3$ (Avg-to-95%tile), thus, this event contributed 1.2 to 11.3 $\mu\text{g}/\text{m}^3$ and we conclude that there would not have been concentrations above the Annual or 24-hour NAAQS "but for" this contribution.
Mitigation:	See Sec 8 and Appendix D	DEQ issued air quality forecast which included appropriate health messaging.



10/12/2012 PM_{2.5} with Average and 95th Percentile for Month (2009-2011)



10/12/2012: Wind Speed and Wind Direction



10/12/2012 Solar Radiation, Temperature and Vert. Temp. Gradient

