NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

ANALYSIS OF THE KING FIRE AS AN EXCEPTIONAL EVENT AND ITS CONTRIBUTION TO HIGH $PM_{2.5}$ CONCENTRATIONS IN CARSON CITY AND GARDNERVILLE, NEVADA

Final Report
August 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

µg/m^3	micrograms per cubic meter
agl	above ground level
AQS	Air Quality System
BAQP	Bureau of Air Quality Planning
CC Armory	Carson City Armory
CFR	Code of Federal Regulations
EER	Exceptional Event Rule
FEM	Federal Equivalence Method
FRM	Federal Reference Method
HYSPLIT	Hybrid Single Particle Lagrangian Integrated Trajectory
m	meters
NAAQS	National Ambient Air Quality Standards
NDEP	Nevada Division of Environmental Protection
NOAA	National Oceanic and Atmospheric Administration
$PM_{2.5}$	Particulate Matter Smaller than 2.5 Micrometers
PST	Pacific Standard Time
USEPA	United States Environmental Protection Agency
UTC	Coordinated Universal Time

ANALYSIS OF THE KING FIRE AS AN EXCEPTIONAL EVENT AND ITS CONTRIBUTION TO HIGH $PM_{2.5}$ CONCENTRATIONS IN CARSON CITY AND GARDNERVILLE, NEVADA BETWEEN SEPTEMBER 14 AND 24, 2014

1.0 INTRODUCTION

The Nevada Division of Environmental Protection (NDEP) Bureau of Air Quality Planning (BAQP) operates a network of ambient air quality monitors at a variety of locations throughout the state of Nevada. The NDEP BAQP's ambient air monitoring network meets the minimum monitoring requirements for all criteria pollutants pursuant to 40 Code of Federal Regulations (CFR) 58, Appendix D. The NDEP BAQP's monitoring network is reviewed annually pursuant to 40 CFR 58.10 to ensure that the network meets the monitoring objectives defined in 40 CFR 58, Appendix D. The approval letter for the NDEP BAQP Annual Network Plan is included in Appendix A. Ambient air monitoring data is collected and data quality is assured in accordance with 40 CFR 58. This data is submitted to the United States Environmental Protection Agency's (USEPA) Air Quality System (AQS). The data for 2014 was certified on April 22, 2015. The Data Certification Letter was submitted to USEPA Region IX on April 22, 2015 as well. The Data Certification Letter is included in Appendix B.

1.1 PURPOSE

On September 13, 2014, a wildland fire started near Pollock Pines, California. Authorities believe the fire was started intentionally, and arson is listed as the official cause. The wildland fire, named the King Fire, was not fully contained until October 9, 2014, and burned more than 97,000 acres. Smoke from this wildland fire caused exceedances of the 35 micrograms per cubic meter ($\mu g/m^3$) of particulate matter smaller than 2.5 micrograms in diameter ($PM_{2.5}$) 24-hour National Ambient Air Quality Standard (NAAQS)[1] at two monitoring locations in Carson City (CC Armory) and Gardnerville (Ranchos), Nevada, approximately 50 miles east-northeast of the King Fire origin.

The purpose of this document is to request exclusion of the 24-hour $PM_{2.5}$ data from the CC Armory and Ranchos air monitoring sites that exceeded the NAAQS as exceptional events under the USEPA's regulation for *The Treatment of Data Influenced by Exceptional Events; Final Rule* (72 FR 13560), known as the Exceptional Events Rule (EER; 40 CFR 50.1 and 51.14). The King Fire was a natural event that caused exceedances of the federal standard for two Federal Equivalent Method (FEM) Beta Attenuation Monitors between September 18 and 23, 2014. The daily maximum FEM concentrations exceeded 275 $\mu g/m^3$ at the Ranchos air monitoring station in Douglas County (AQS Site Code 32-005-0007) and 295 $\mu g/m^3$ at the CC Armory air monitoring station in Carson City (AQS Site Code 32-510-0020-1).

[1] NAAQS are pollutant-specific levels set by the USEPA to protect public health and welfare. The NAAQS for $PM_{2.5}$ is 35 micrograms per cubic meter ($\mu g/m^3$) averaged over 24 hours.

The elevated particulate matter concentrations observed between September 14 and 24, 2014 occurred as a result of the smoke generated by the King Fire. The NDEP BAQP has submitted the hourly $PM_{2.5}$ data from the affected monitors on those days to the USEPA AQS database and has placed the appropriate AQS flags throughout the data to indicate that the data was affected by an exceptional event due to wildfire. Informational flags (IT) were also included for other monitored criteria pollutants at each site for the same time period. This flagging indicates that the ambient air quality data was influenced by the smoke plume emissions and ensures that the data is properly represented in the regulatory process. This document provides evidence in support of this request.

Additional information used in this analysis beyond what is included in Section 2 is provided in separate appendices.

1.2 EXCEPTIONAL EVENTS RULE AND BACKGROUND

In 1977, the USEPA began implementing policies to address the usage of ambient air quality monitoring data affected by exceptional and/or natural events. In July 1986, the USEPA issued a document entitled *Guideline on the Identification and Use of Air Quality Data Affected by Exceptional Events*, which introduced a flagging system to identify air quality measurements that were influenced by exceptional events, and to exclude such data from consideration in determining compliance with the NAAQS. This data, if left unidentified, could lead to possible misinterpretation or misuse of the data. In March 2007, the USEPA promulgated a formal rule, entitled *The Treatment of Data Influenced by Exceptional Events; Final Rule*. The rule defines exceptional events as either anthropogenic events that are unlikely to recur at a particular location, or natural events, which may recur, sometimes frequently. These exceptional events must affect air quality and may not be controllable or preventable using techniques that tribal, state, or local air agencies could reasonably implement in order to achieve and maintain the NAAQS. After an event is classified by the USEPA as an exceptional event, the data related to that event is flagged as such in the USEPA AQS database. The flagged data remains available to the public but is not considered in determining attainment status. The USEPA Exceptional Event Rule has several goals. The rule:

- ensures that air quality measurements are properly evaluated and characterized with regard to their cause(s);
- identifies reasonable actions that should be taken to address the air quality and public health impacts caused by exceptional events;
- intends to avoid imposing unreasonable planning requirements on state, local, and tribal air quality agencies related to exceedances of the NAAQS due to exceptional events; and
- ensures that the use of air quality data, whether afforded special treatment or not, is subject to full public disclosure and review.

Packages requesting the exclusion of data affected by exceptional events must demonstrate that:

- the event affected air quality;
- the event was not reasonably controllable or preventable;
- the event was caused by human activity that is unlikely to reoccur at a particular location, or was a natural event;
- there was a clear causal relationship between the specific event and the monitored concentration(s);
- the event is associated with a measured concentration in excess of normal historical fluctuations, including background; and
- there would have been no exceedance or violation but for the event.

The following analysis demonstrates that a clear causal relationship exists between the smoke from the King Fire and the $PM_{2.5}$ concentrations at the Ranchos and CC Armory monitoring sites. This analysis includes monitoring data, meteorological data, wind trajectories, emissions information, and historical data. The NDEP BAQP concludes that, but for smoke from the wildfire, the measured concentrations at the Ranchos and CC Armory monitoring sites would not have exceeded the NAAQS.

2.0 WILDLAND FIRE EXCEPTIONAL EVENT ANALYSIS

2.1 OVERVIEW OF EVENT

The King Fire was started, authorities believe intentionally, on September 13, 2014, approximately 17 kilometers east-northeast of Placerville, California (Figure 1). The fire burned approximately 20 acres the first day, and within 72 hours had grown to more than 8,000 acres. Between Tuesday, September 16, 2014 and Thursday, September 18, 2014, the fire increased in size from approximately 8,600 acres to more than 70,000 acres. The rapid growth of the fire was due to a variety of factors, including a history of fire suppression and urban growth around the National Forest. In addition, northern California had one of the driest years on record in 2013 (as measured in Tahoe City, California). This set the stage for the ongoing drought to reach the exceptional stage, by causing timber to be more prone to large, catastrophic fires in the following years. As such, Northern California was experiencing a severe to exceptional drought in the summer of 2014, and the National Oceanic and Atmospheric Administration (NOAA) lists 2014 as the warmest year in the historical record (NWS, 2016).

The King Fire was declared 100 percent contained on October 9, 2014 after burning more than 97,000 acres within the El Dorado National Forest.

2.2 AFFECTED AIR QUALITY

According to the EER, an event is considered to have affected air quality if there is a clear causal relationship between the event in question and the monitored exceedance, and if the event in question is associated with measured concentrations in excess of normal historical fluctuations (72 FR 13560). These criteria are discussed in Sections 2.5 and 2.6 of this document.

Although the King Fire started on September 13, 2014, smoke from the fire did not significantly impact air quality in Carson City and Gardnerville, Nevada until September 18, 2014. This is in part due to a rapid escalation of the fire between September 16 and September 18. In addition, according to National Weather Service meteorologists,

> "Wind patterns were quite varied over Lake Tahoe and western Nevada September 18-23, 2014 but are consistent with what the hysplit plots depict. The period began with prevailing free atmosphere west/southwest flow which is typical for this time of year. This swept smoke from the King Fire into the region. During the 19-20th, a passing low pressure area switched the winds to more of an easterly direction. This unusual pattern shifted much of the new King Fire smoke to west of the Sierra crest. Starting late in the day on the 21st, lasting through at least the 23rd, free atmosphere winds shifted back to south/southwesterly. These winds combined with the normal afternoon/evening zephyr westerly wind brought dense smoke back into the Tahoe and western Nevada regions. This was especially true in the afternoon/evening hours when the zephyr is the most pronounced. Overall this is a fairly typical weather setup for mid/late

> September, however the free atmosphere winds were probably a little stronger than normal 23rd-25th due to approaching low pressure from the Gulf of Alaska. This system ended up bringing widespread rains to the region the 25th-26th which contributed to a rapid reduction in King Fire activity." (NWS, 2016).

Figures 2A and 2B show views to the northwest from the BAQP web camera on the roof of the NDEP building in Carson City, Nevada, on September 18, 2013 at 1500 coordinated universal time (UTC) and at 2230 UTC, respectively.

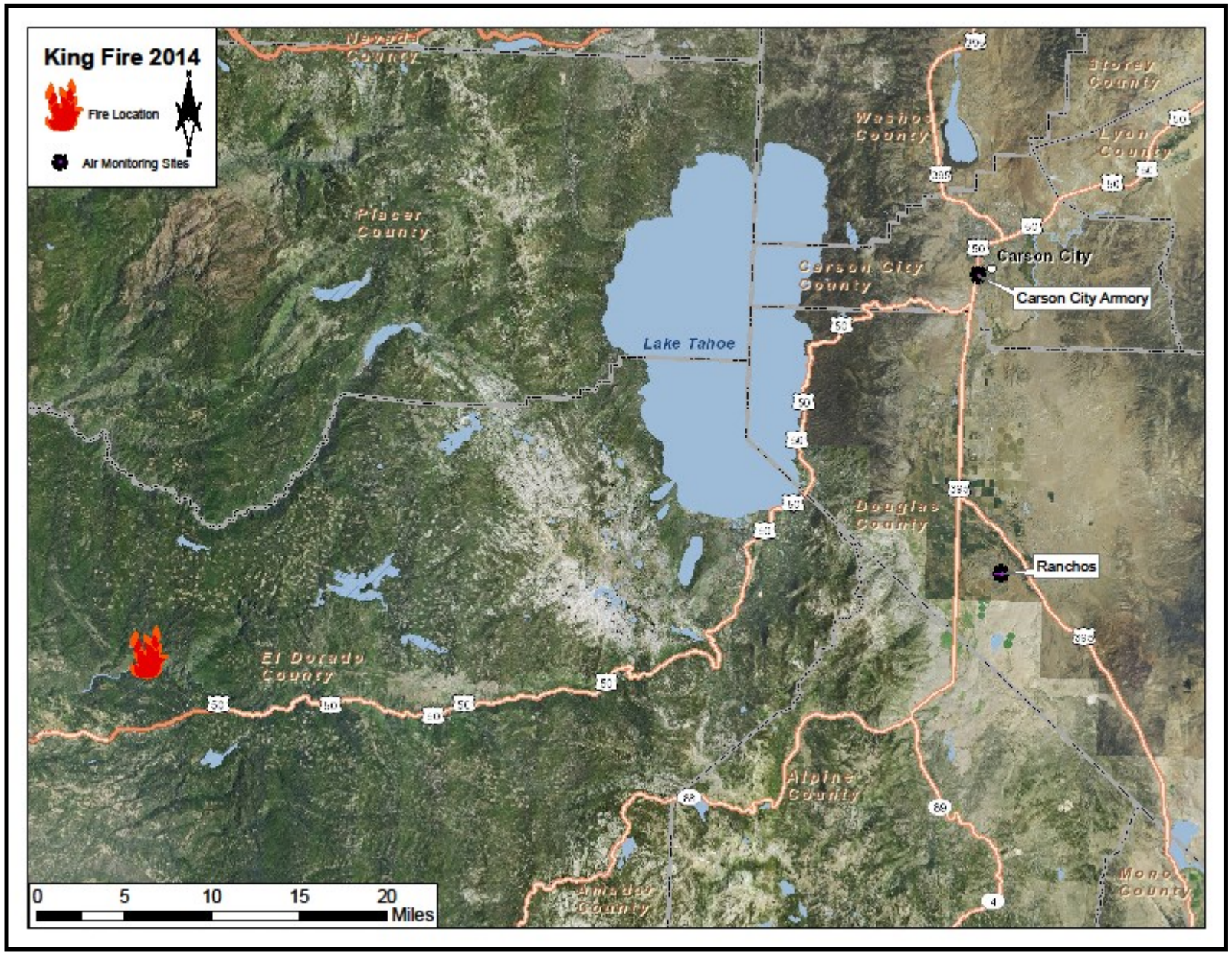


Figure 1 Location of the King Fire Origin and the CC Armory and Ranchos $PM_{2.5}$ Monitoring Sites

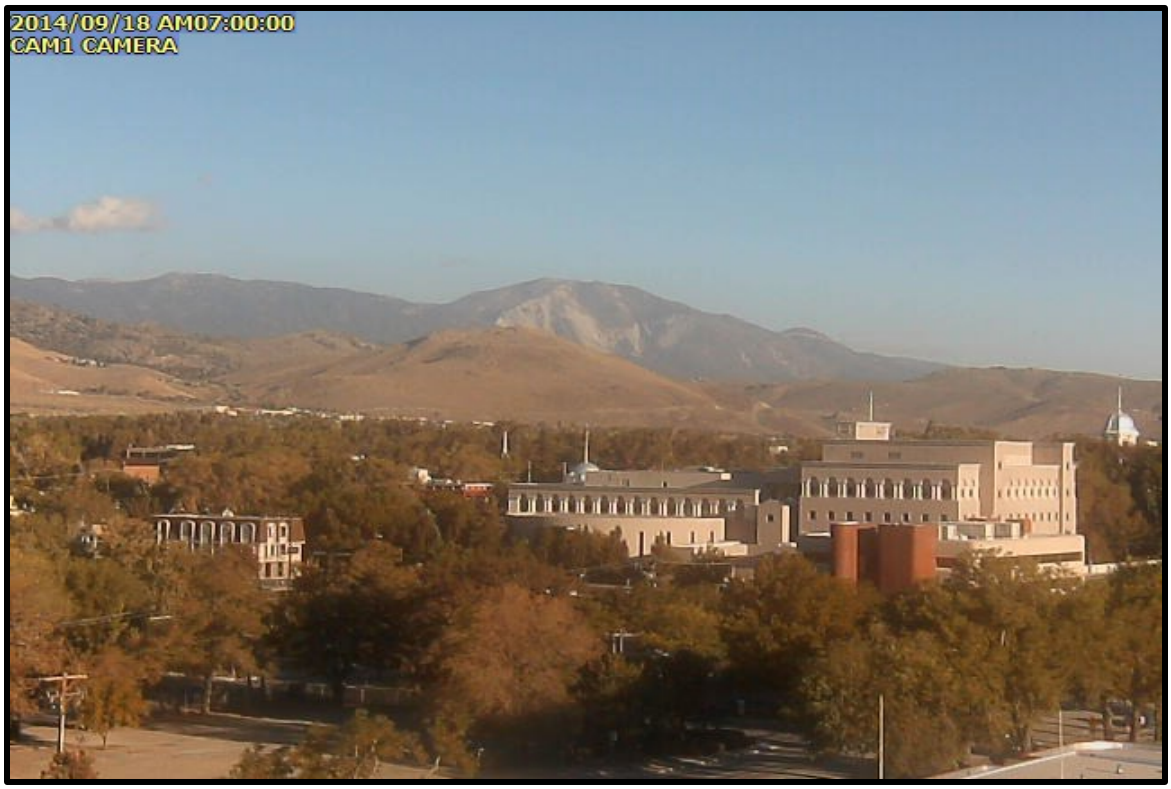


Figure 2A View to the northwest from the NDEP Building in Carson City, Nevada, at Approximately 0700 PST (1500 UTC) on September 18, 2014

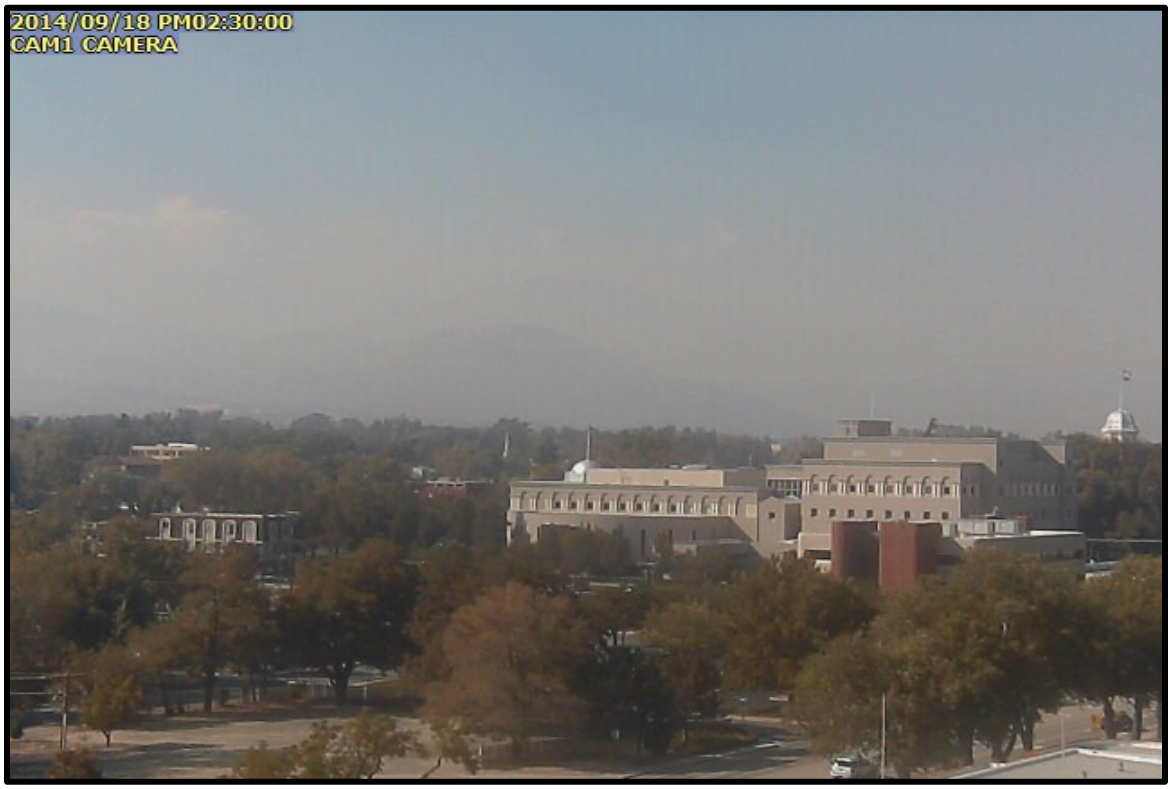


Figure 2B View to the northwest from the NDEP Building in Carson City, Nevada, at Approximately 1430 PST (2230 UTC) on September 18, 2014.

Between September 14 and 24, 2014, smoke from the King Fire resulted in abnormally high 24-hour average $PM_{2.5}$ concentrations throughout western Nevada. Exceedances of the $PM_{2.5}$ NAAQS were recorded at the Ranchos and CC Armory $PM_{2.5}$ FEM/FRM monitors on three of the days within this period. The daily maximum and the 24-hour average (midnight to midnight) concentrations for the monitors are listed in Table 1 from midnight on September 7, 2014 through midnight on October 1, 2014. Table 2 summarizes this information.

Table 1 $PM_{2.5}$ Hourly Averages and Maximums for CC Armory and Ranchos Monitoring Sites from September 7 through October 1, 2014.

Date	$PM_{2.5}$ Concentrations ($\mu g/m^3$)			
	CC Armory (FEM/FRM Data)		Ranchos	
	Daily Maximum	24-hour Average[1]	Daily Maximum	24-hour Average
09/07/2014	10.0	2.1	13.0	2.6
09/08/2014	7.0	1.7/3.9	17.0	4.0
09/09/2014	21.0	6.8	18.0	8.3
09/10/2014	17.0	10.9	18.0	12.2
09/11/2014	12.0	5.5	14.0	8.2
09/12/2014	8.0	3.1	11.0	5.4
09/13/2014	10.0	4.1	12.0	5.6
09/14/2014	**27.0**	**9.0/9.3**	**11.0**	**4.0**
09/15/2014	**79.1**	**14.3**	**10.0**	**5.6**
09/16/2014	**55.0**	**8.9**	**10.0**	**2.2**
09/17/2014	**6.0**	**-0.3**	**6.0**	**1.7**
09/18/2014	**174.0**	**44.4**	**196.0**	**37.3**
09/19/2014	**106.0**	**33.3**	**116.0**	**40.5**
09/20/2014	**14.0**	**5.3/7.5**	**19.0**	**7.5**
09/21/2014	**138.0**	**28.0**	**23.0**	**7.5**
09/22/2014	**297.0**	**76.6**	**280.0**	**47.5**
09/23/2014	**137.0**	**51.2**	**53.0**	**14.6**
09/24/2014	**29.0**	**6.0**	**8.0**	**4.0**
09/25/2014	7.0	2.1	8.0	4.3
09/26/2014	4.0	1.2/1.5	20.0	5.5
09/27/2014	5.0	0.8	11.0	6.4
09/28/2014	19.0	3.1	14.0	6.1
09/29/2014	10.0	3.5	14.0	6.0
09/30/2014	11.0	3.8	15.0	6.4
10/01/2014	4.0	1.2	9.0	3.6

[1]: Cells with two entries contain both the FEM (primary) and FRM (collocated) data values. Note that the FRM is not the primary monitor for this site.

Table 2 Monitoring Sites Exceeding NAAQS 24-hour Average $PM_{2.5}$ Standard (35µg/m³)

Monitoring Site	AQS Number	Dates of Exceedance	Daily Maximum	Maximum 24-hour Average $PM_{2.5}$ Concentration (µg/m³)	Date of Maximum
CC Armory	32-510-0020-1	09/18/2014 09/22/2014 09/23/2014	297	76.6	09/22/2014
Ranchos	32-005-0007	09/18/2014 09/19/2014 09/22/2014	280	47.5	09/22/2014

Figures 3A through 3K show this data graphically for the CC Armory and the Ranchos monitoring stations, from 0000 on September 14 through 2359 Pacific Standard Time (PST) on September 24, 2014. The hourly $PM_{2.5}$ concentration first exceeded 35 µg/m³ at the CC Armory site during the 1700 PST hour on September 15, 2014 and at the Ranchos site during the 1800 PST hour on September 18, 2014. The hourly $PM_{2.5}$ concentrations at the CC Armory and Ranchos monitoring sites varied somewhat between September 14 and September 24, 2014, depending on severity of the fire and meteorological conditions; the 24-hour average concentration at both sites exceeded the NAAQS on three of the 11 days at both sites. The peak daily maximum concentrations during this time period were 297 µg/m³ at the CC Armory site and 280 µg/m³ at the Ranchos site; both occurred on September 22, 2014.

Figure 3A 24-Hour Average $PM_{2.5}$ Concentrations at the Ranchos and CC Armory Monitoring Sites on September 14, 2014

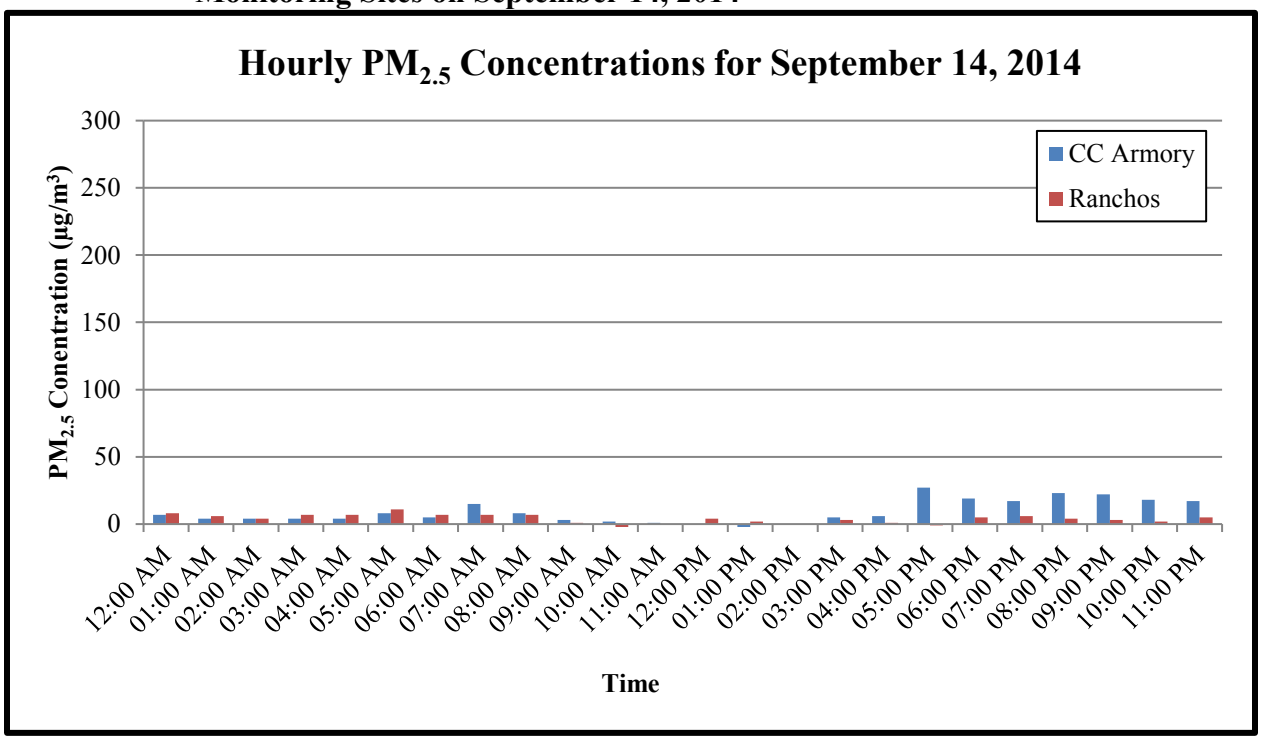


Figure 3B **24-Hour Average $PM_{2.5}$ Concentrations at the Ranchos and CC Armory Monitoring Sites on September 15, 2014**

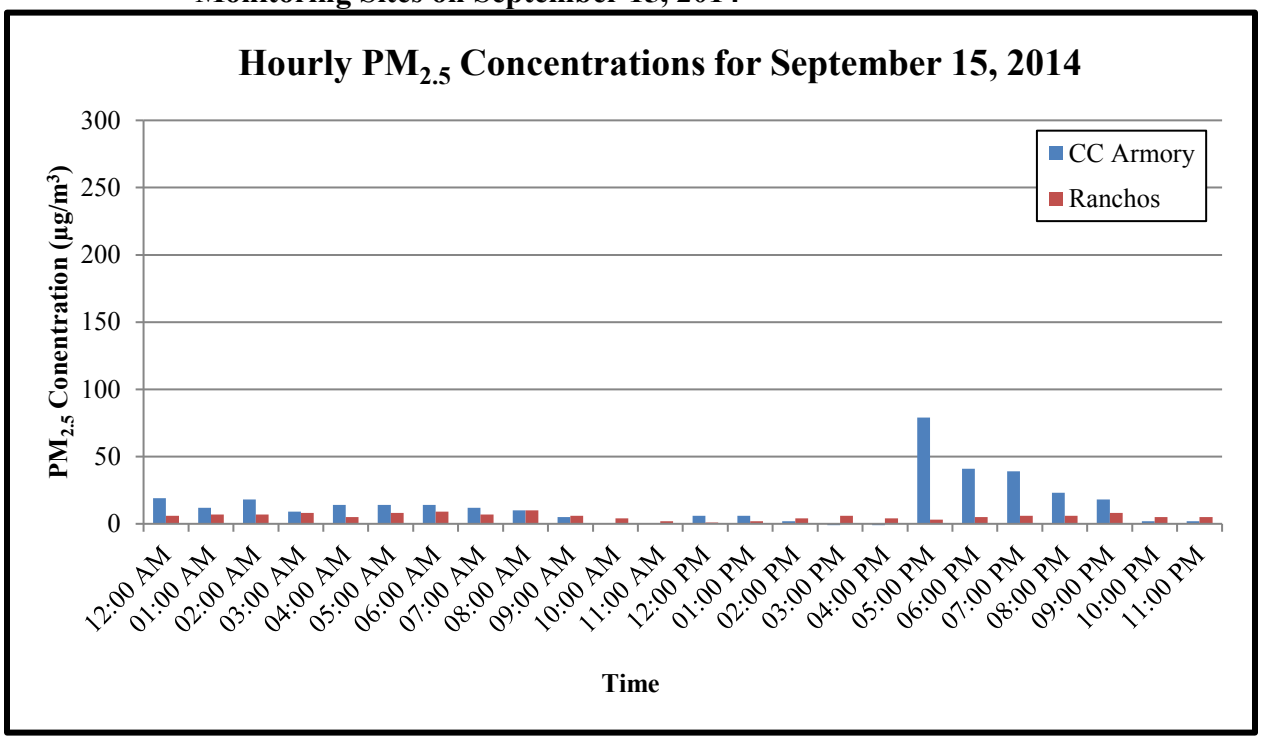


Figure 3C **24-Hour Average $PM_{2.5}$ Concentrations at the Ranchos and CC Armory Monitoring Sites on September 16, 2014**

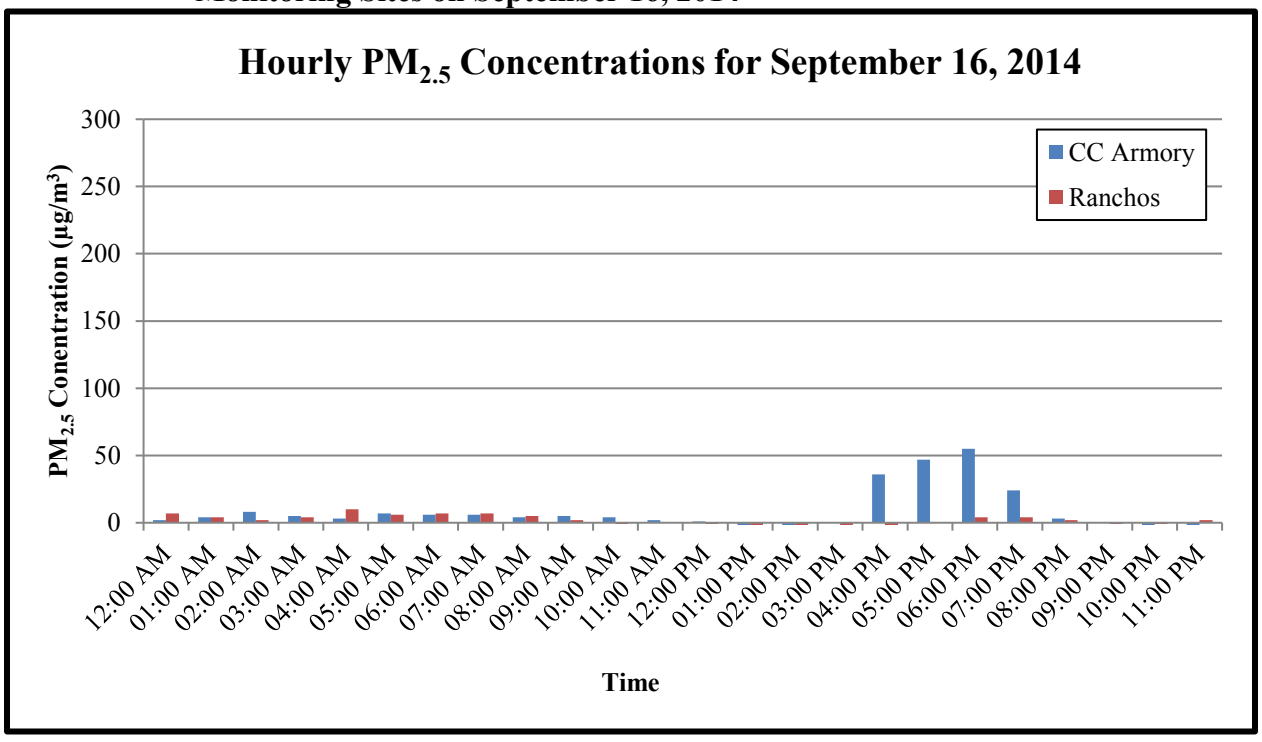


Figure 3D **24-Hour Average $PM_{2.5}$ Concentrations at the Ranchos and CC Armory Monitoring Sites on September 17, 2014**

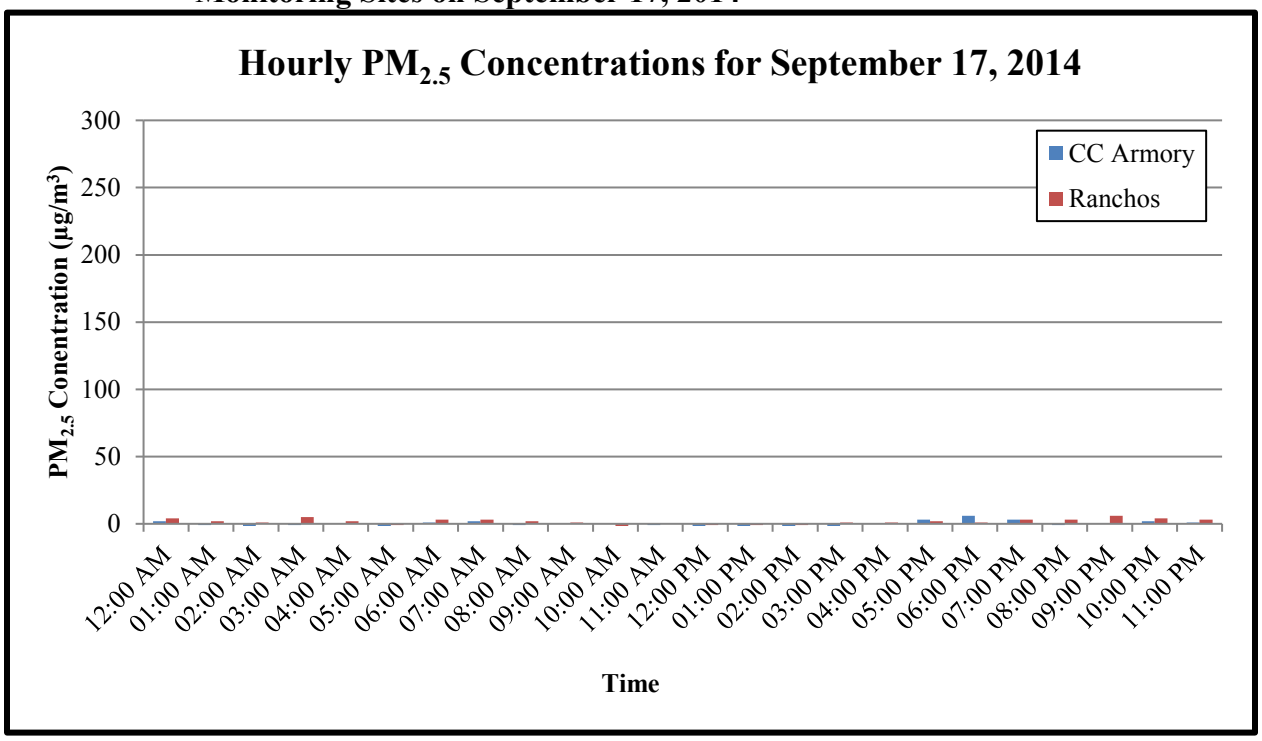


Figure 3E **24-Hour Average $PM_{2.5}$ Concentrations at the Ranchos and CC Armory Monitoring Sites on September 18, 2014**

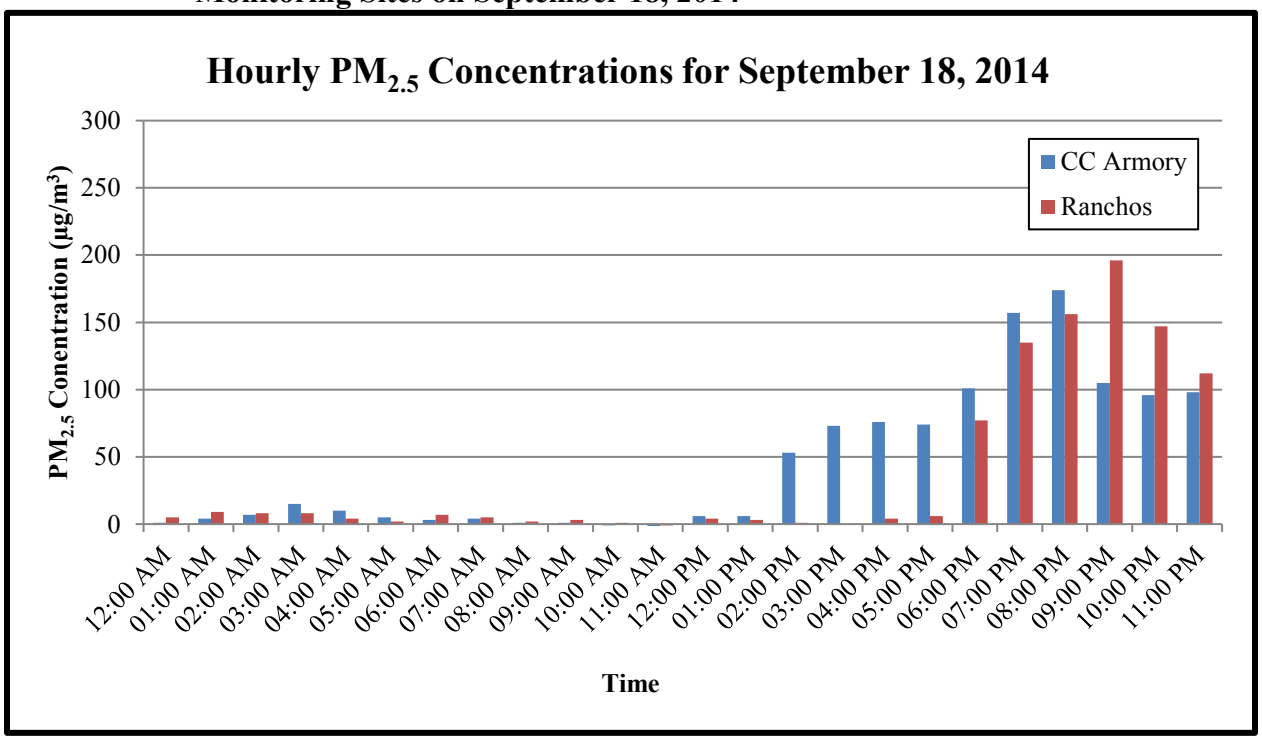


Figure 3F **24-Hour Average $PM_{2.5}$ Concentrations at the Ranchos and CC Armory Monitoring Sites on September 19, 2014**

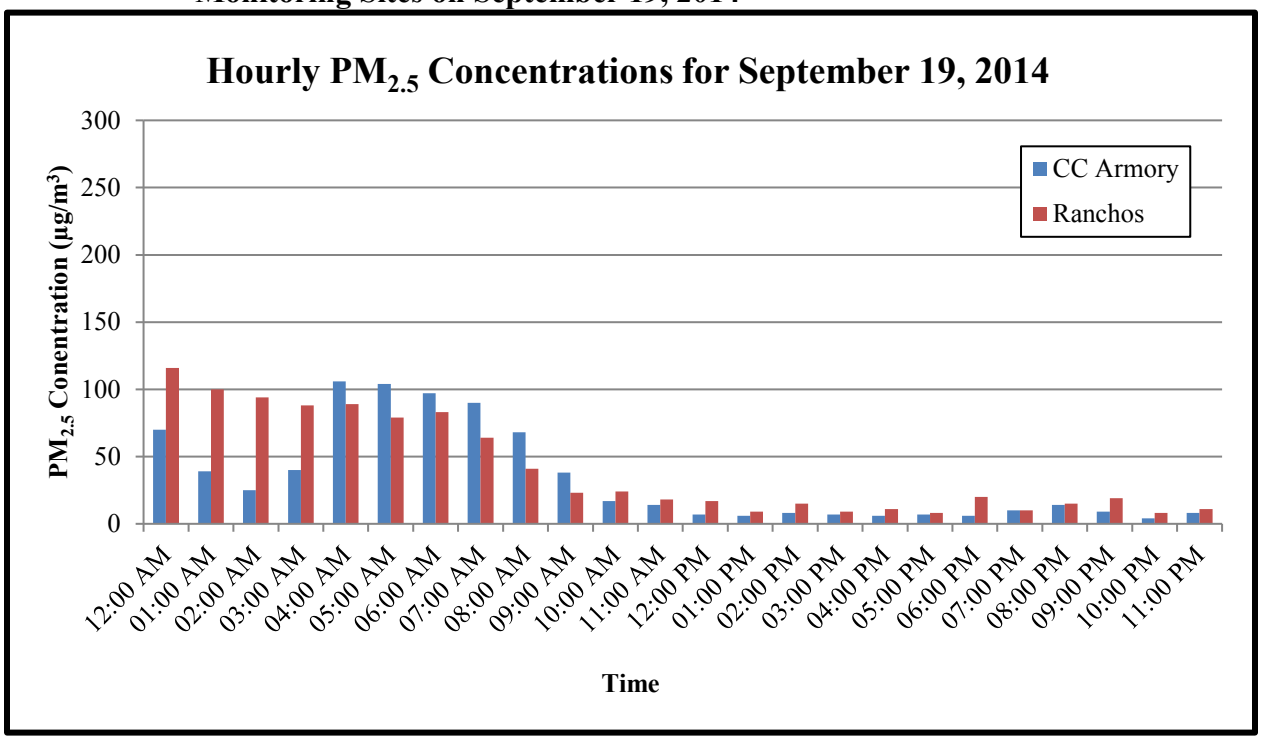


Figure 3G **24-Hour Average $PM_{2.5}$ Concentrations at the Ranchos and CC Armory Monitoring Sites on September 20, 2014**

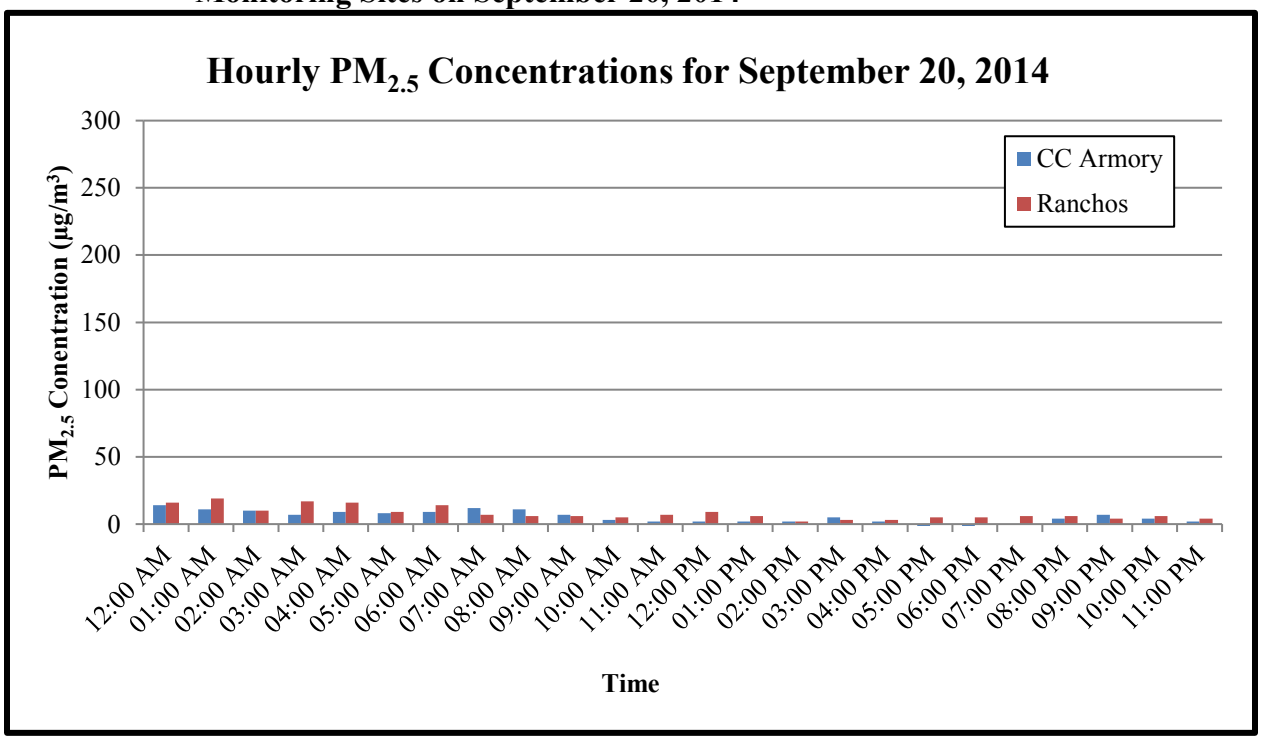


Figure 3H **24-Hour Average $PM_{2.5}$ Concentrations at the Ranchos and CC Armory Monitoring Sites on September 21, 2014**

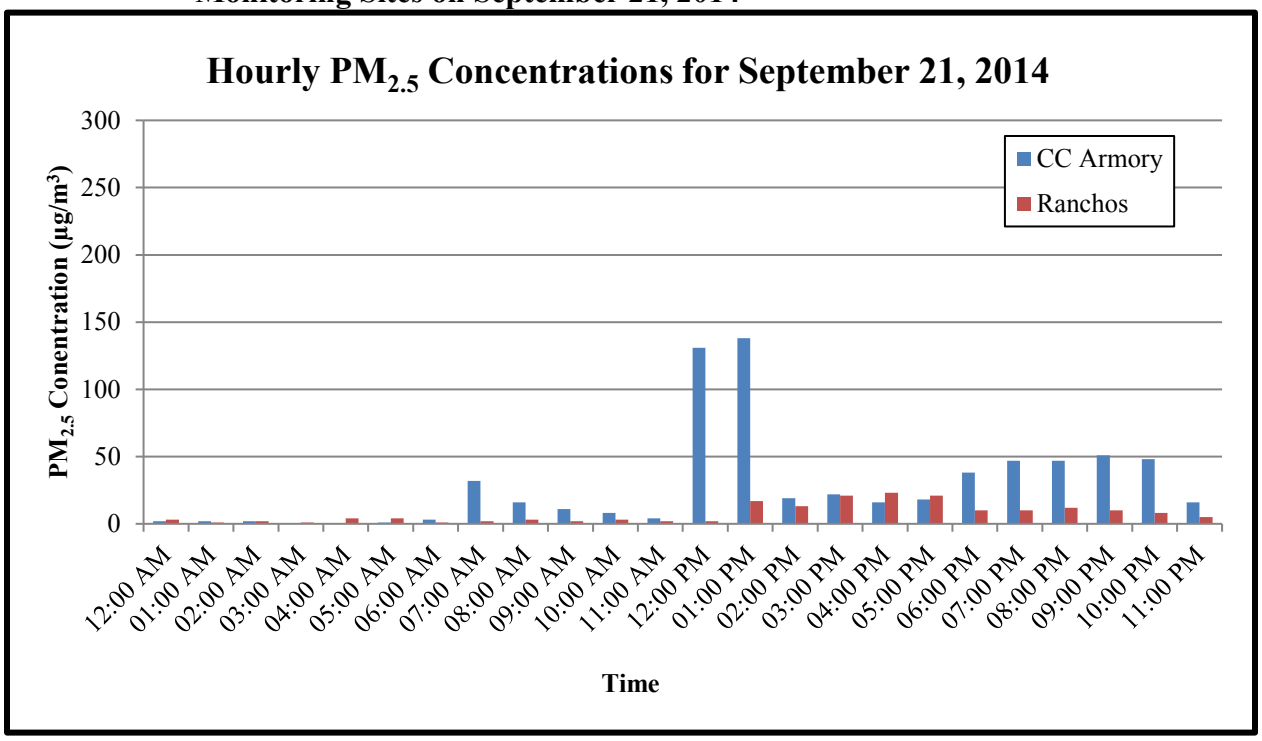


Figure 3I **24-Hour Average $PM_{2.5}$ Concentrations at the Ranchos and CC Armory Monitoring Sites on September 22, 2014**

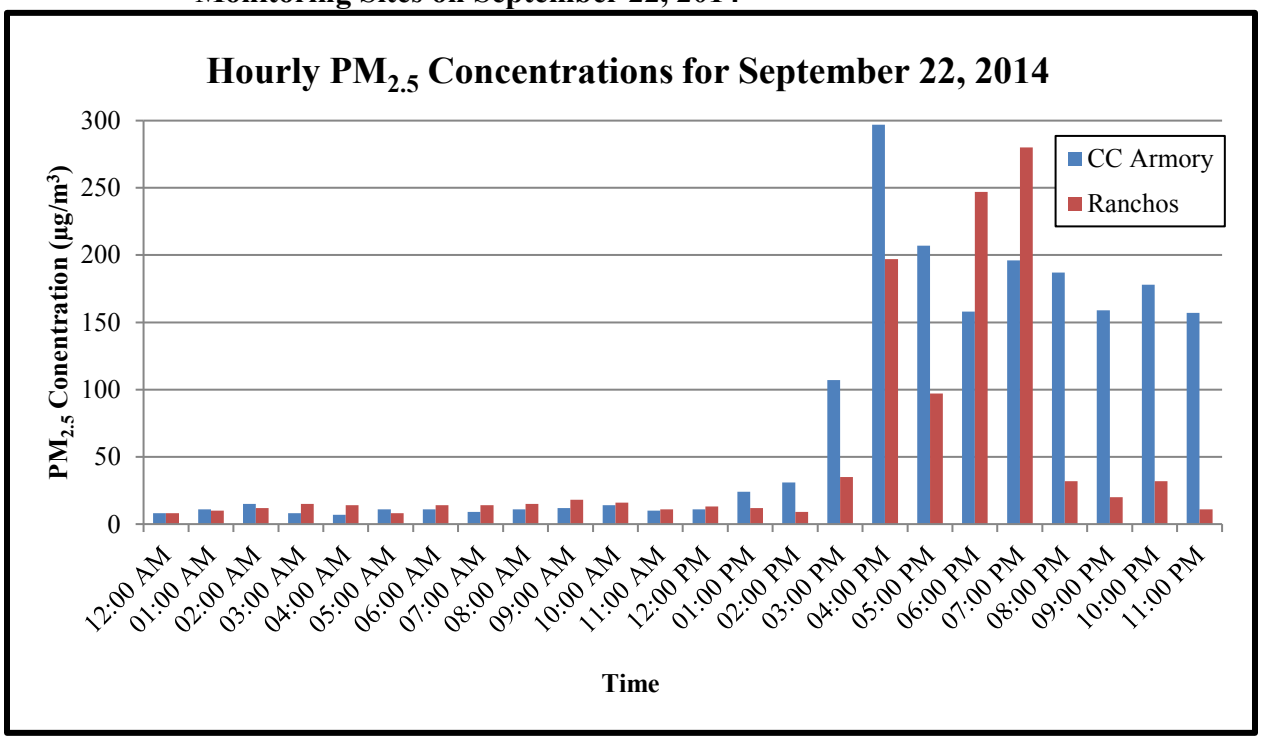


Figure 3J **24-Hour Average $PM_{2.5}$ Concentrations at the Ranchos and CC Armory Monitoring Sites on September 23, 2014**

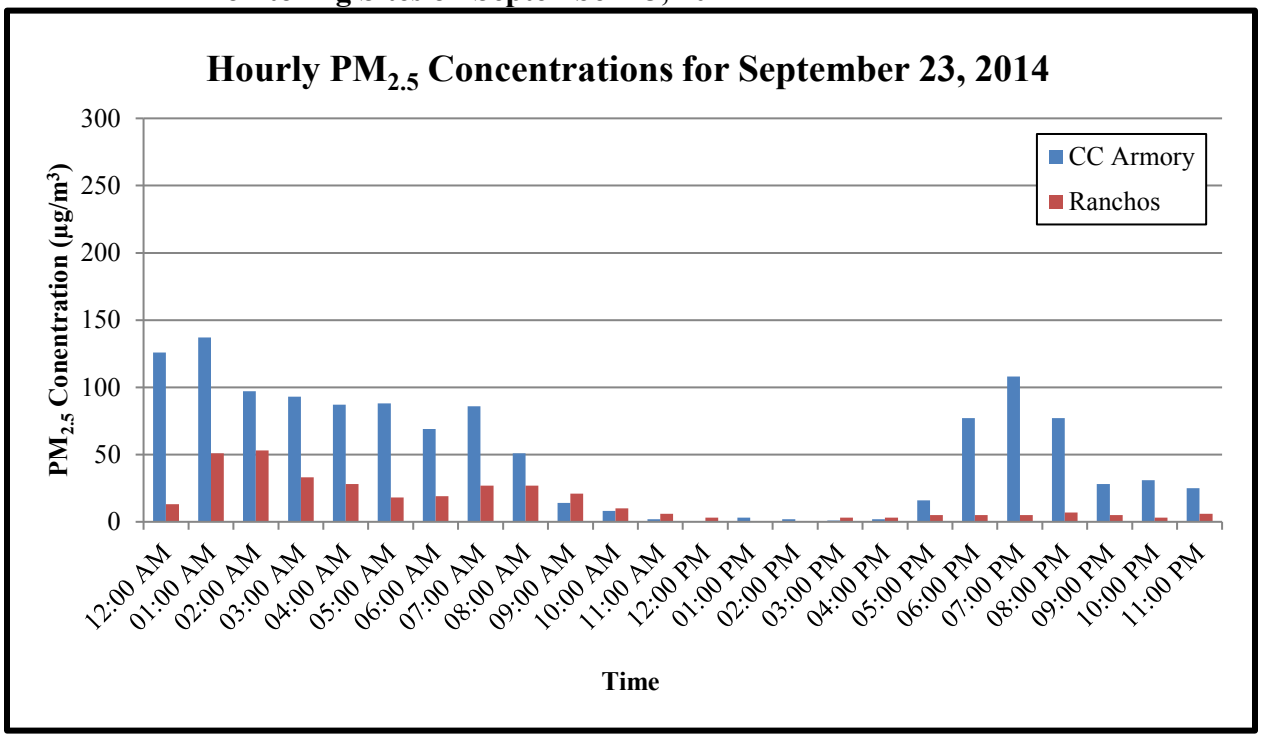
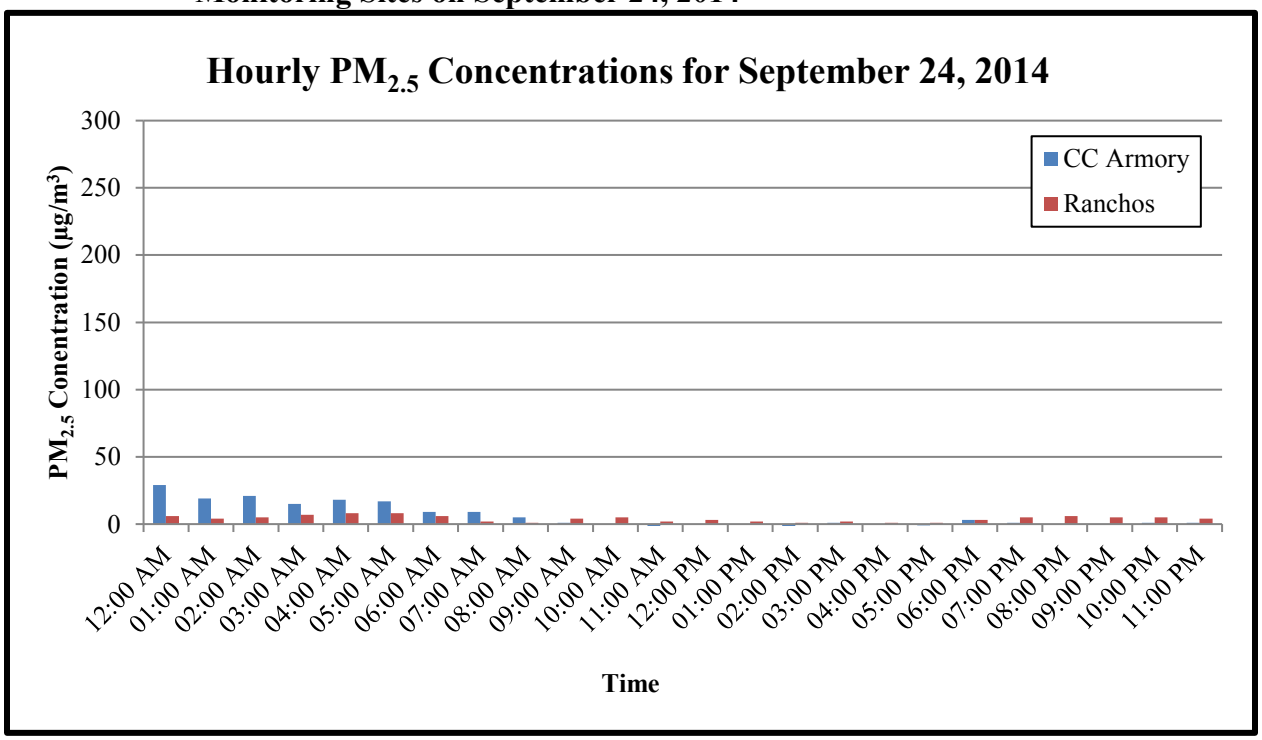


Figure 3K **24-Hour Average $PM_{2.5}$ Concentrations at the Ranchos and CC Armory Monitoring Sites on September 24, 2014**



2.3 NOT REASONABLY CONTROLLABLE OR PREVENTABLE

The EER considers wildland fire a type of natural event. The EER further defines a wildland fire as "…an unplanned, unwanted wildland fire…includ[ing] unauthorized human-caused fires (such as arson or careless acts of campers)." The King Fire was intentionally started (arson), and therefore qualifies as a wildland fire.

The NDEP concludes that, because the King Fire was an unplanned wildland fire caused by arson, which qualifies it as a natural event, this event was not reasonably controllable or preventable.

2.4 UNLIKELINESS OF REOCCURRENCE OR NATURAL EVENT

The King Fire was an unauthorized, human-caused fire, and the severity of the fire was due in part to historical fire suppression activities. The burned area is highly unlikely to burn again in the near future due to a lack of fuel.

The King Fire was caused by unauthorized human activity that is unlikely to recur at the same location.

2.5 CLEAR CAUSAL CONNECTION

NOAA Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) Models were used in conjunction with wind roses to show causal connection between the King Fire and elevated $PM_{2.5}$ concentrations at the Ranchos and CC Armory monitoring sites. HYSPLIT forward trajectories were generated from the location of the King Fire origin at 10, 100, and 500 meters (m) above ground level (agl) to demonstrate that smoke particles from the fire were transported toward the Carson City and Gardnerville monitoring sites. HYSPLIT backward trajectories for the same heights were also generated. In addition, wind roses were created using wind speed and wind direction data from the CC Armory meteorological tower. Figures 4 through 19 show both the HYSPLIT forward trajectories and the wind roses for each day that the monitors were affected by smoke from the King Fire, broken out into 12-hour periods (0000 through 1159 and 1200 through 2359 PST). The 12-hour average and $PM_{2.5}$ concentrations for both the Ranchos and the CC Armory FEM monitoring sites are shown as well. The forward HYSPLIT models were originally generated with three trajectories, at 10, 100, and 500 m agl. Only the 500 m trajectory is shown on Figures 4 through 19. The original forward HYSPLIT models with all three trajectories are included in Appendix C. Backward HYSPLIT trajectories are included in Appendix D. Although the forward HYSPLIT trajectories start at the origin of the King Fire, the smoke plume is the actual source of $PM_{2.5}$ particles, and extends some distance from the origin.

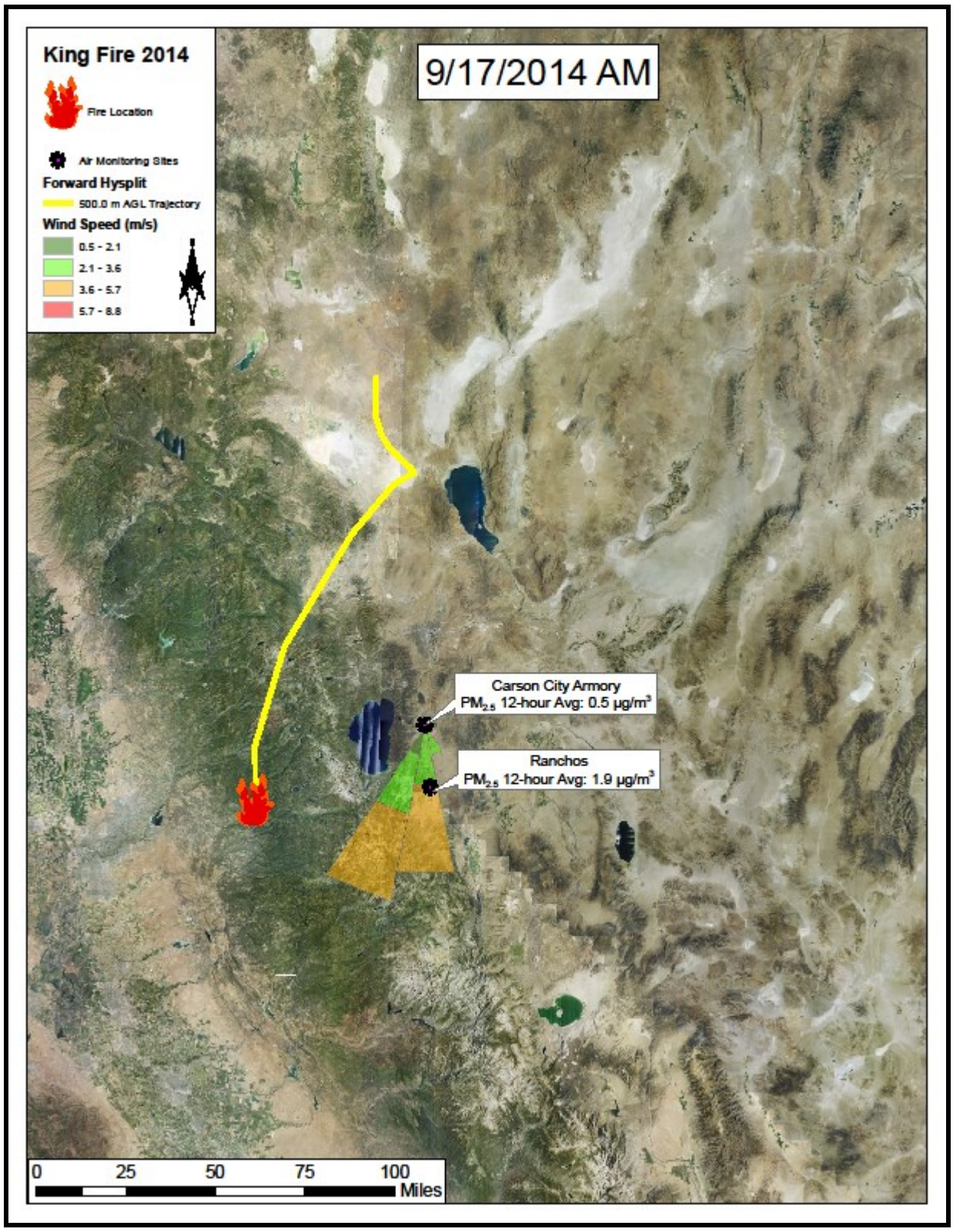


Figure 4 **Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 17, 2014, 0000 to 1159 PST.**

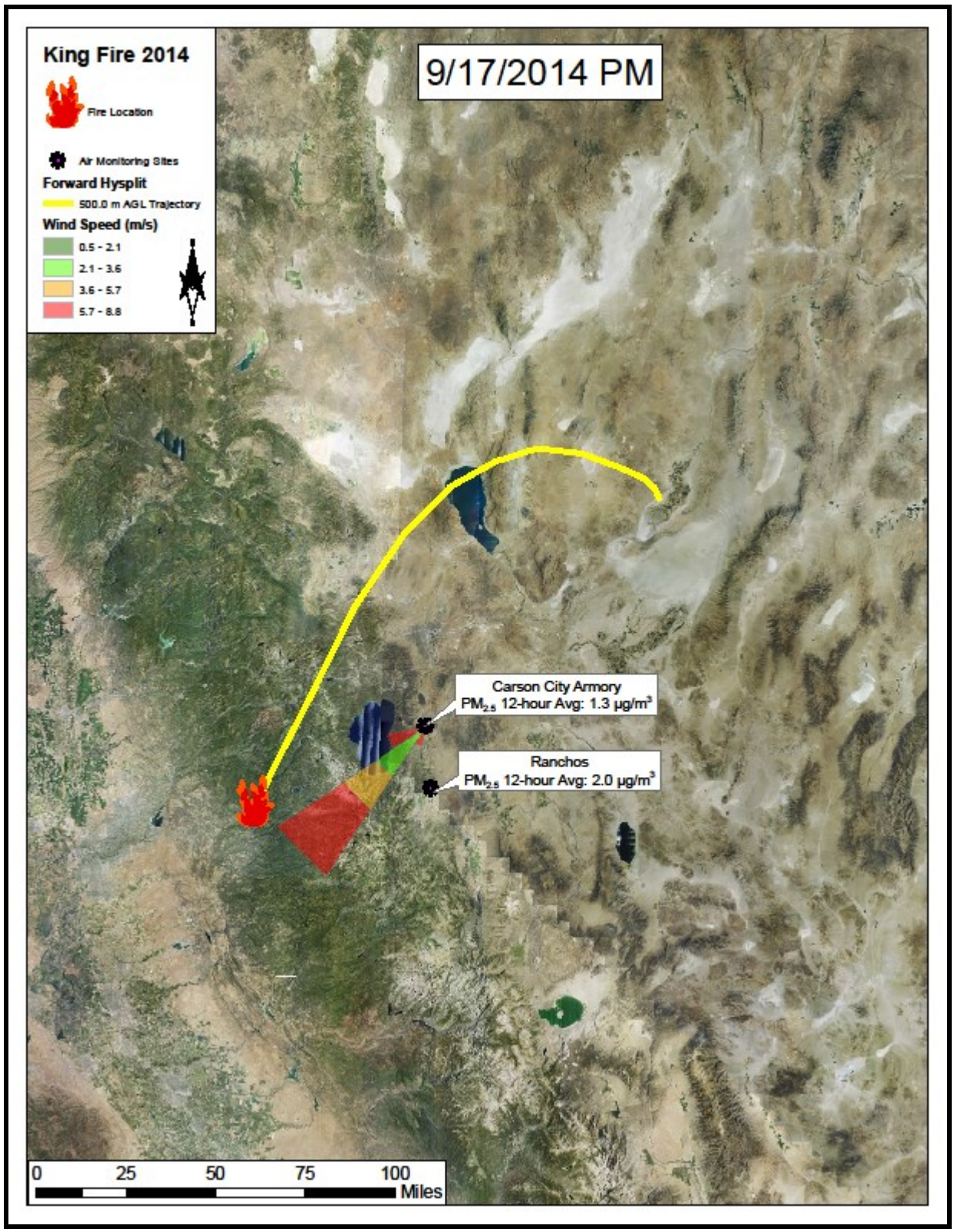


Figure 5 **Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 17, 2014, 1200 to 2359 PST.**

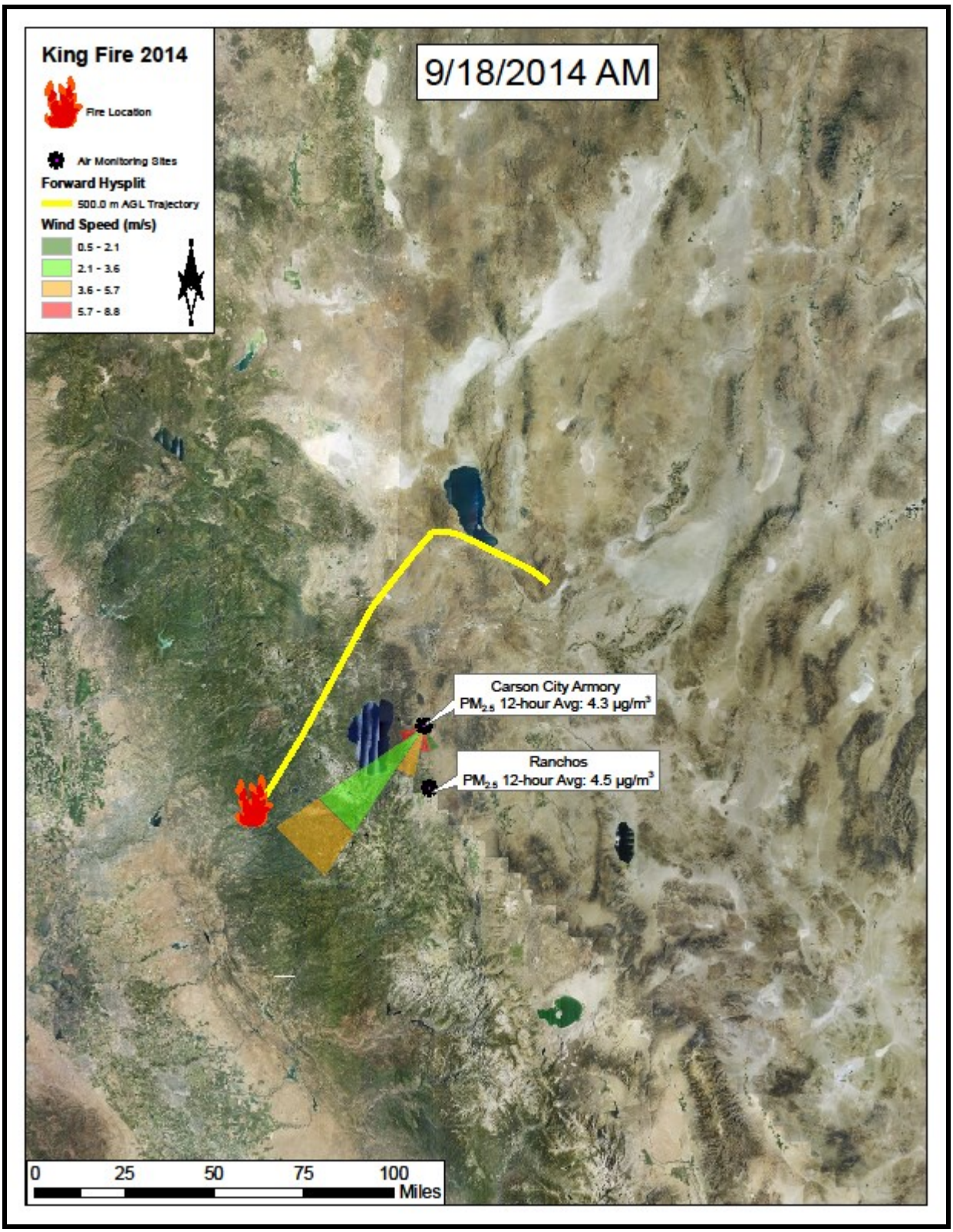


Figure 6 **Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 18, 2014, 0000 to 1159 PST.**

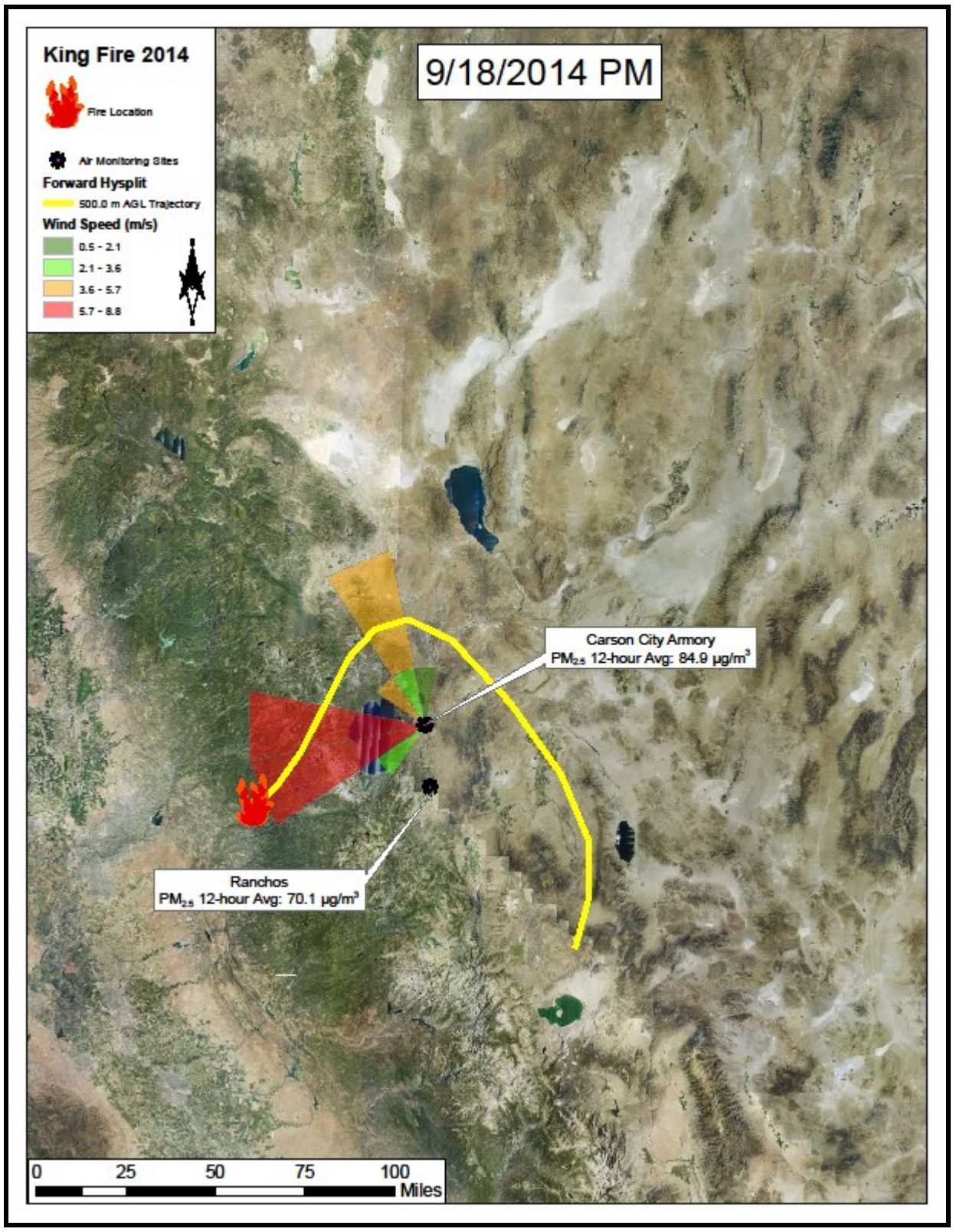


Figure 7 **Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 18, 2014, 1200 to 2359 PST.**

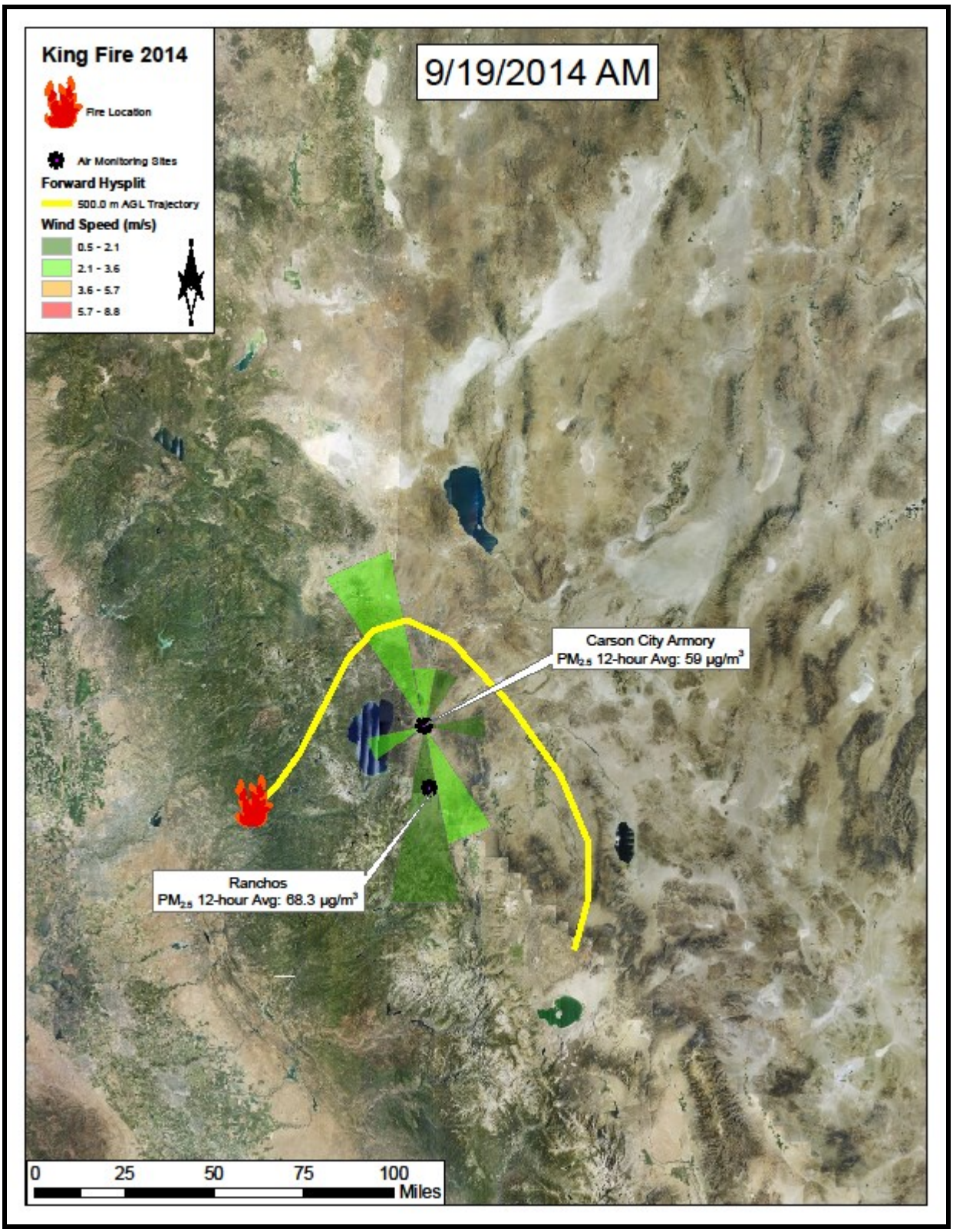


Figure 8 **Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 19, 2014, 0000 to 1159 PST.**

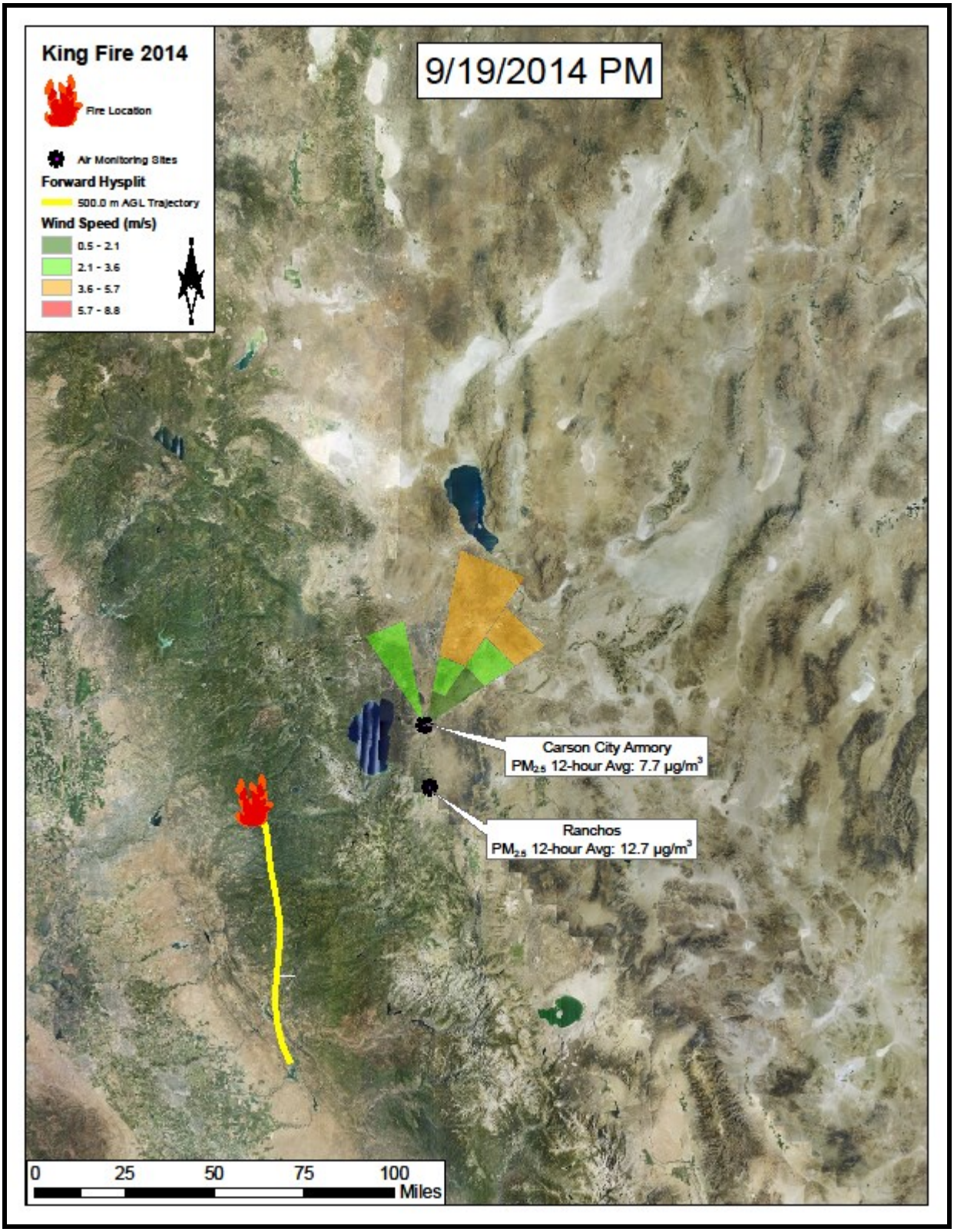


Figure 9 **Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 19, 2014, 1200 to 2359 PST.**

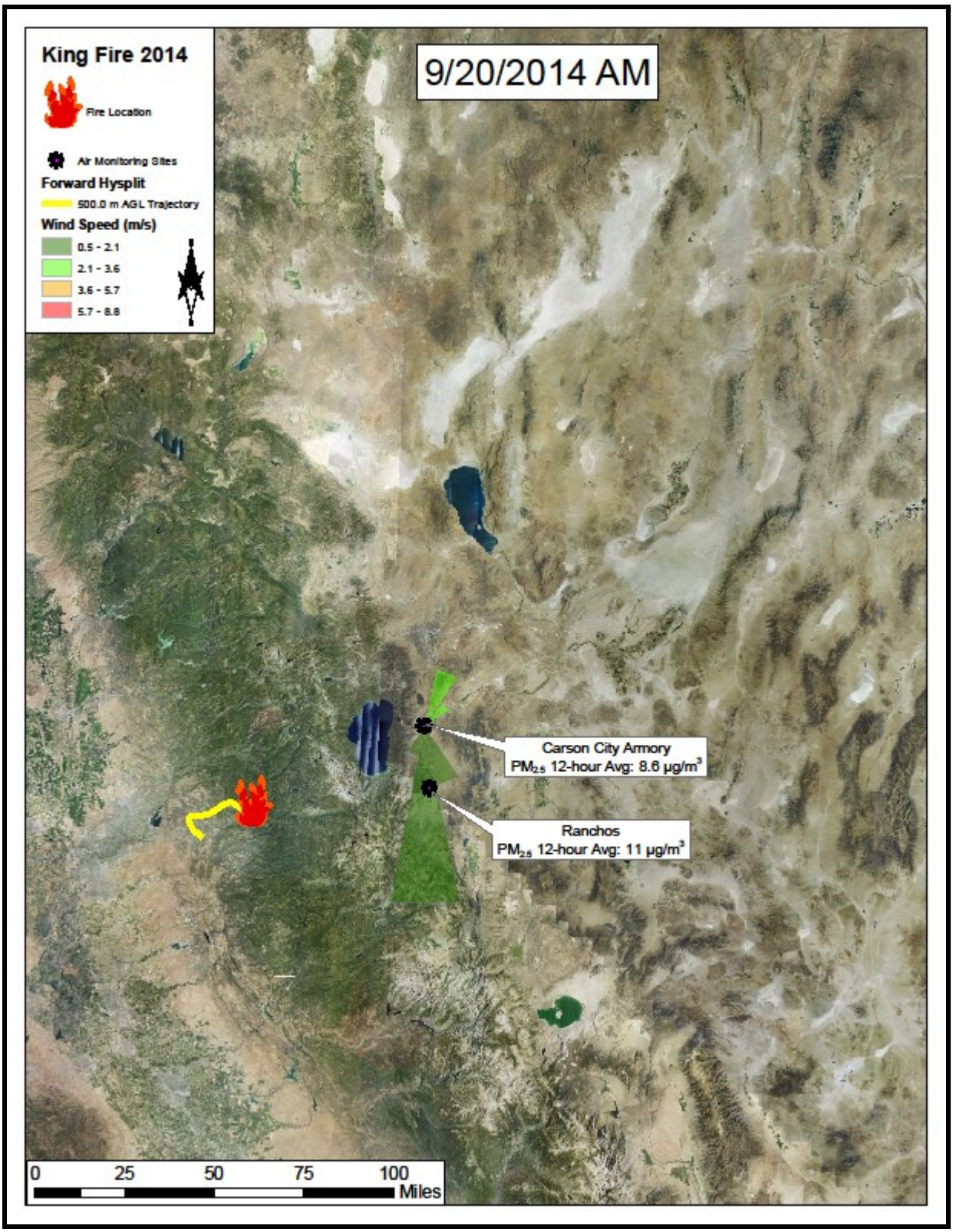


Figure 10 **Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 20, 2014, 0000 to 1159 PST.**

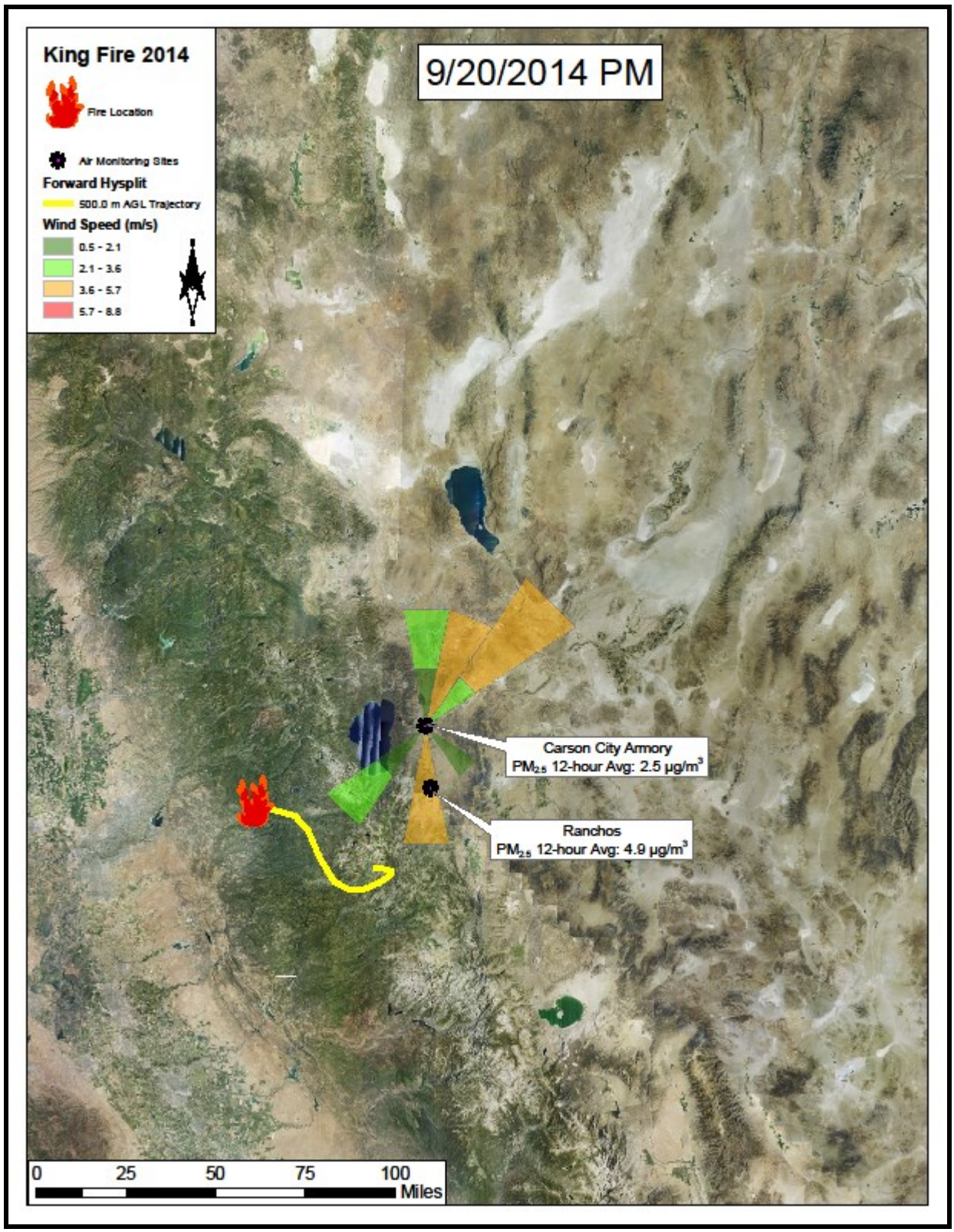


Figure 11 Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 20, 2014, 1200 to 2359 PST.

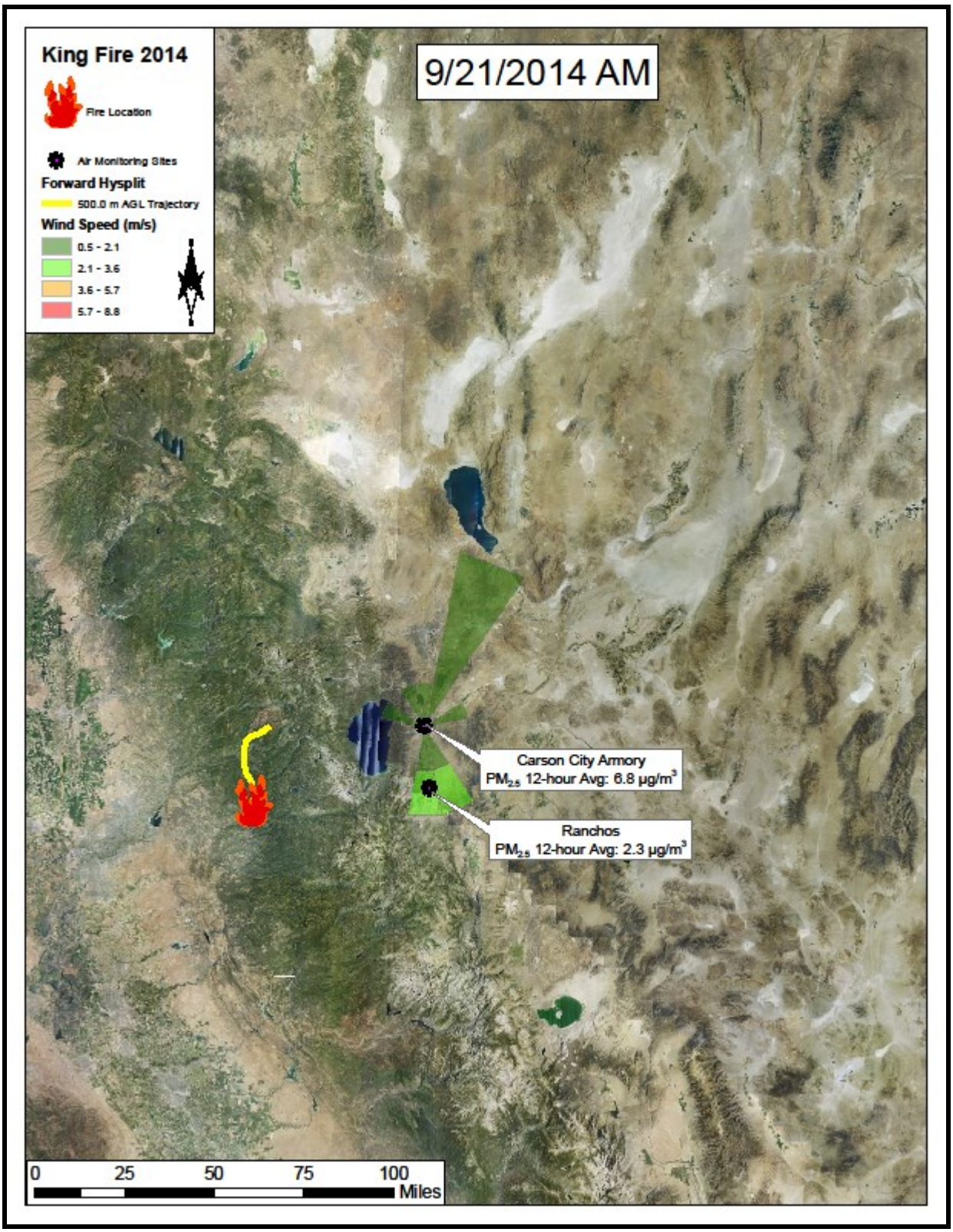


Figure 12 **Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 21, 2014, 0000 to 1159 PST.**

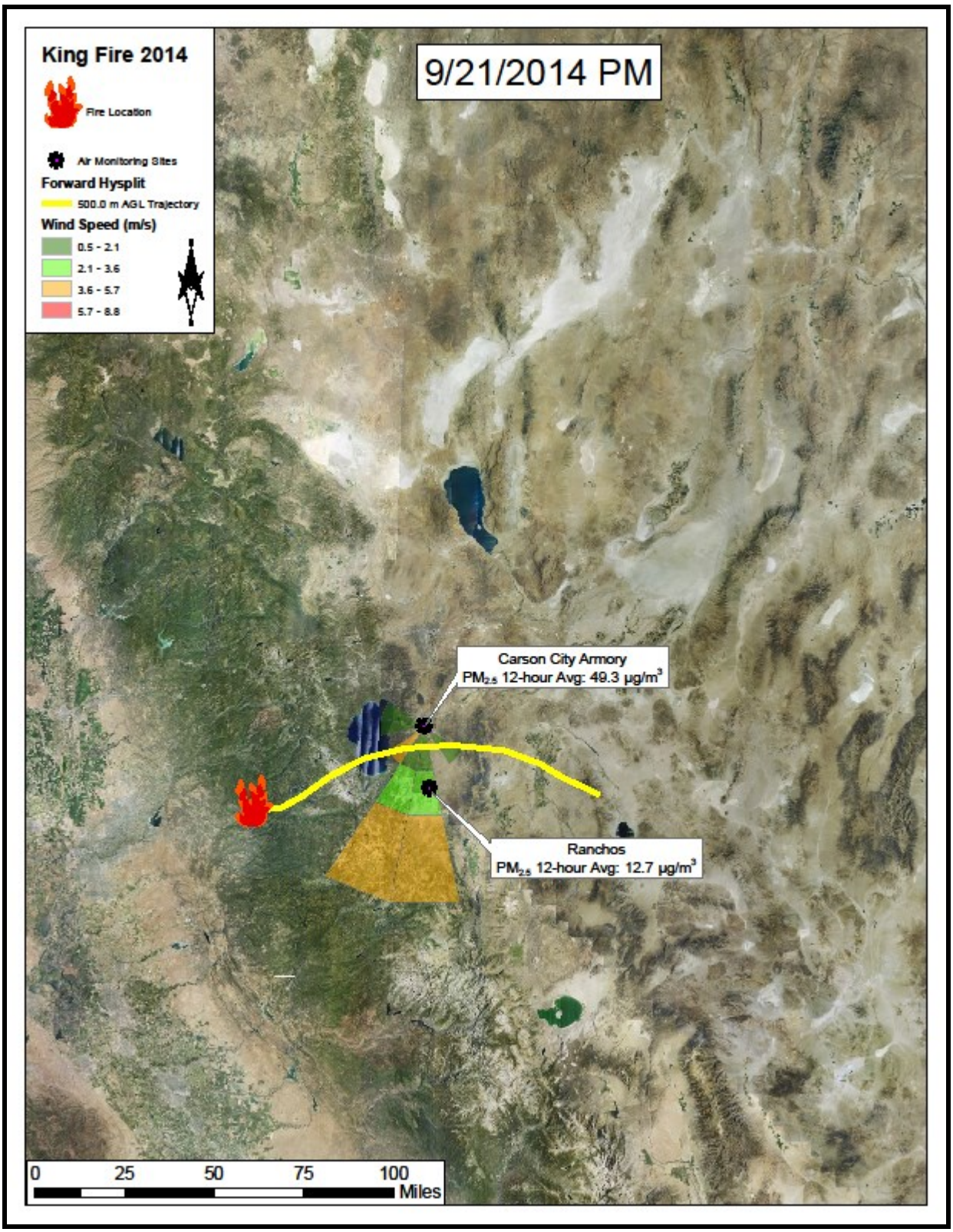


Figure 13 **Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 21, 2014, 1200 to 2359 PST.**

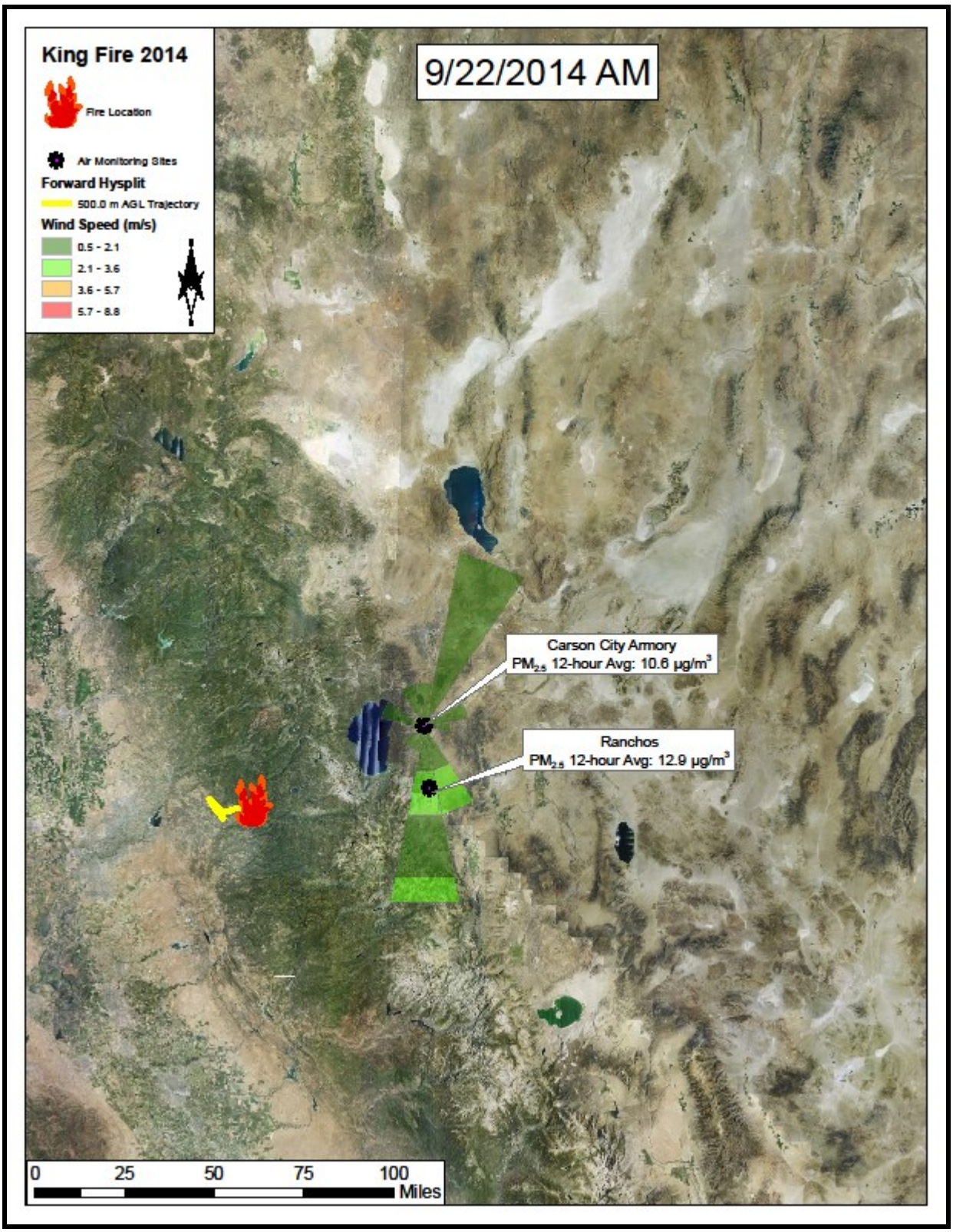


Figure 14 **Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 22, 2014, 0000 to 1159 PST.**

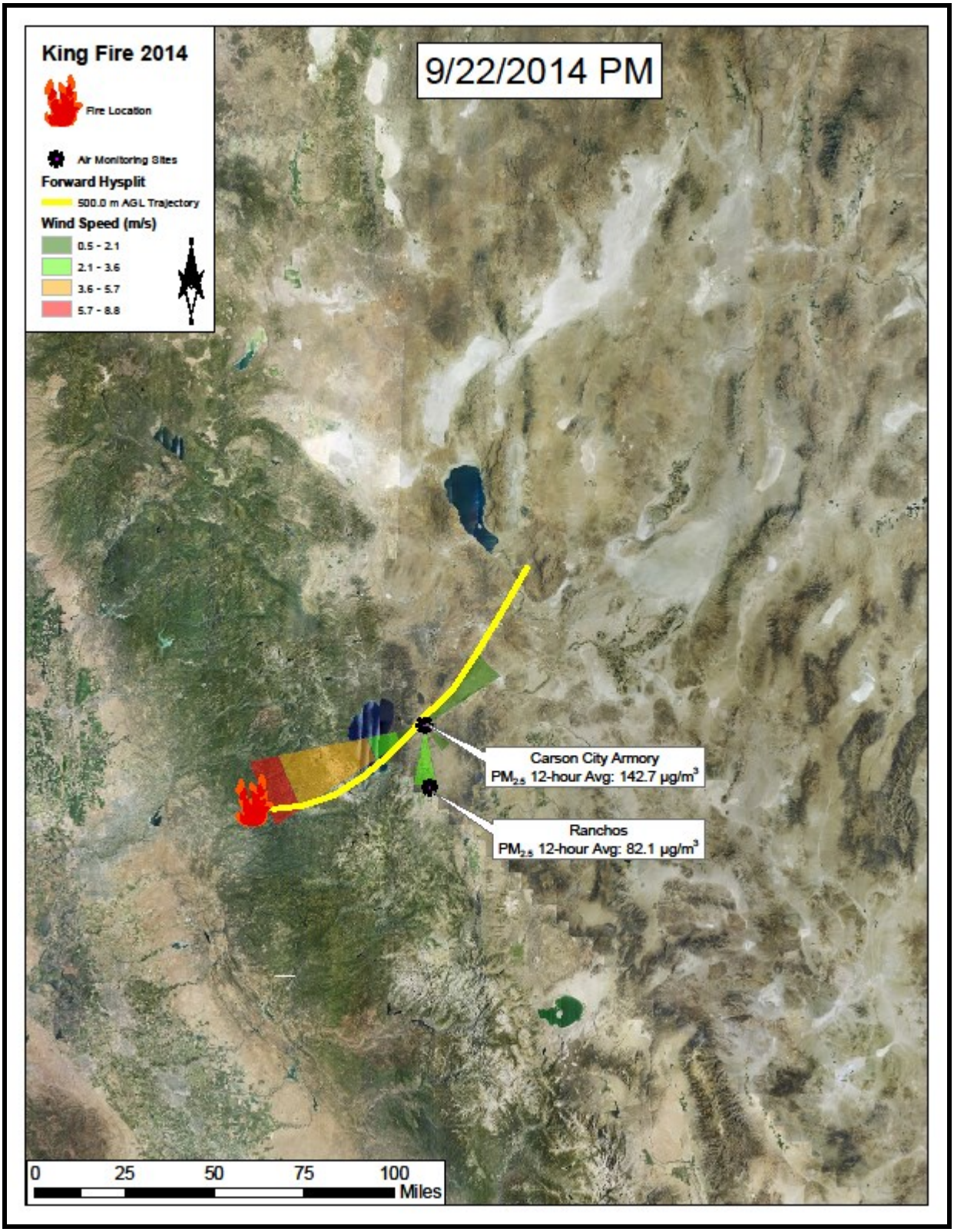


Figure 15 Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 22, 2014, 1200 to 2359 PST.

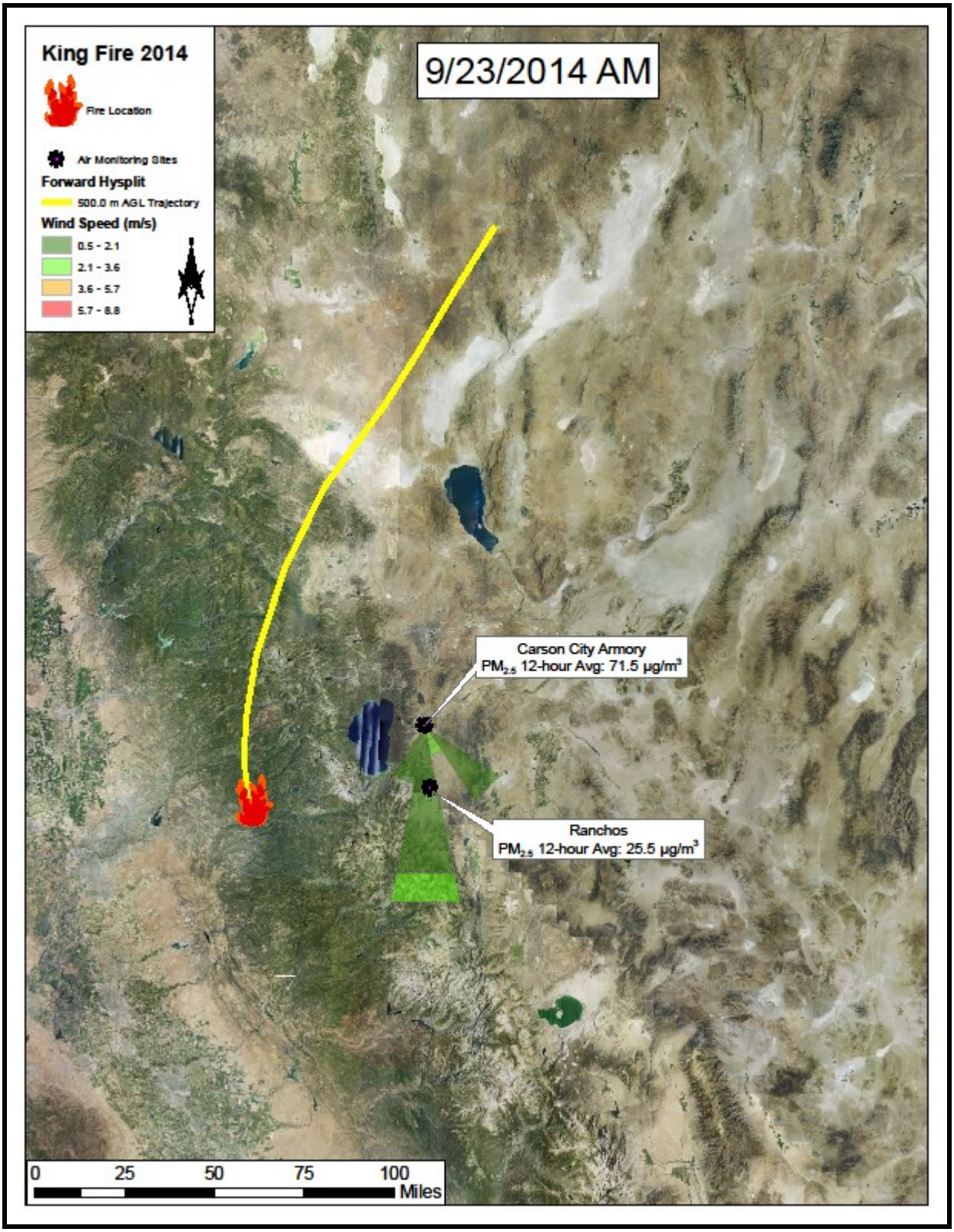


Figure 16 Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 23, 2014, 0000 to 1159 PST.

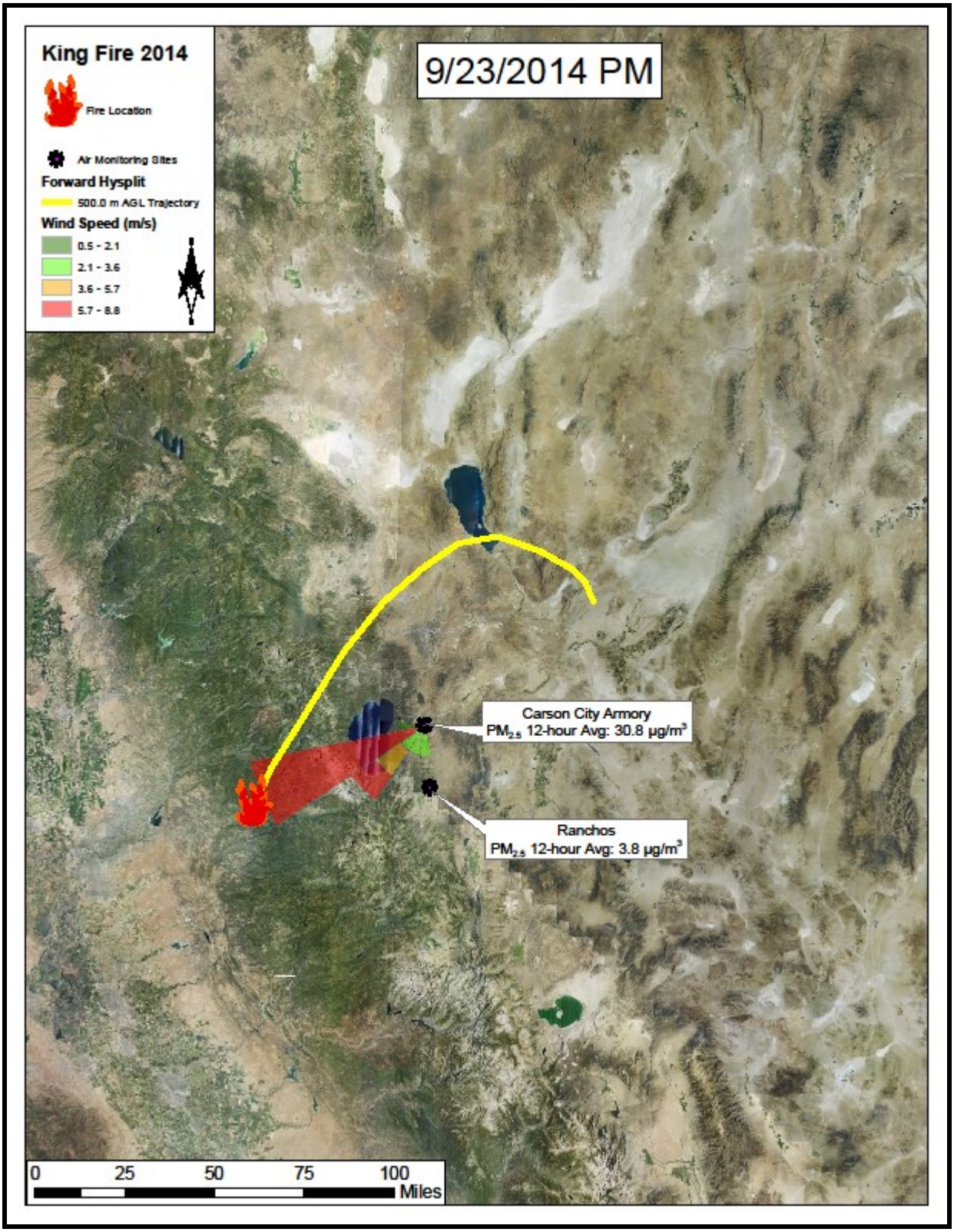


Figure 17 Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 23, 2014, 1200 to 2359 PST.

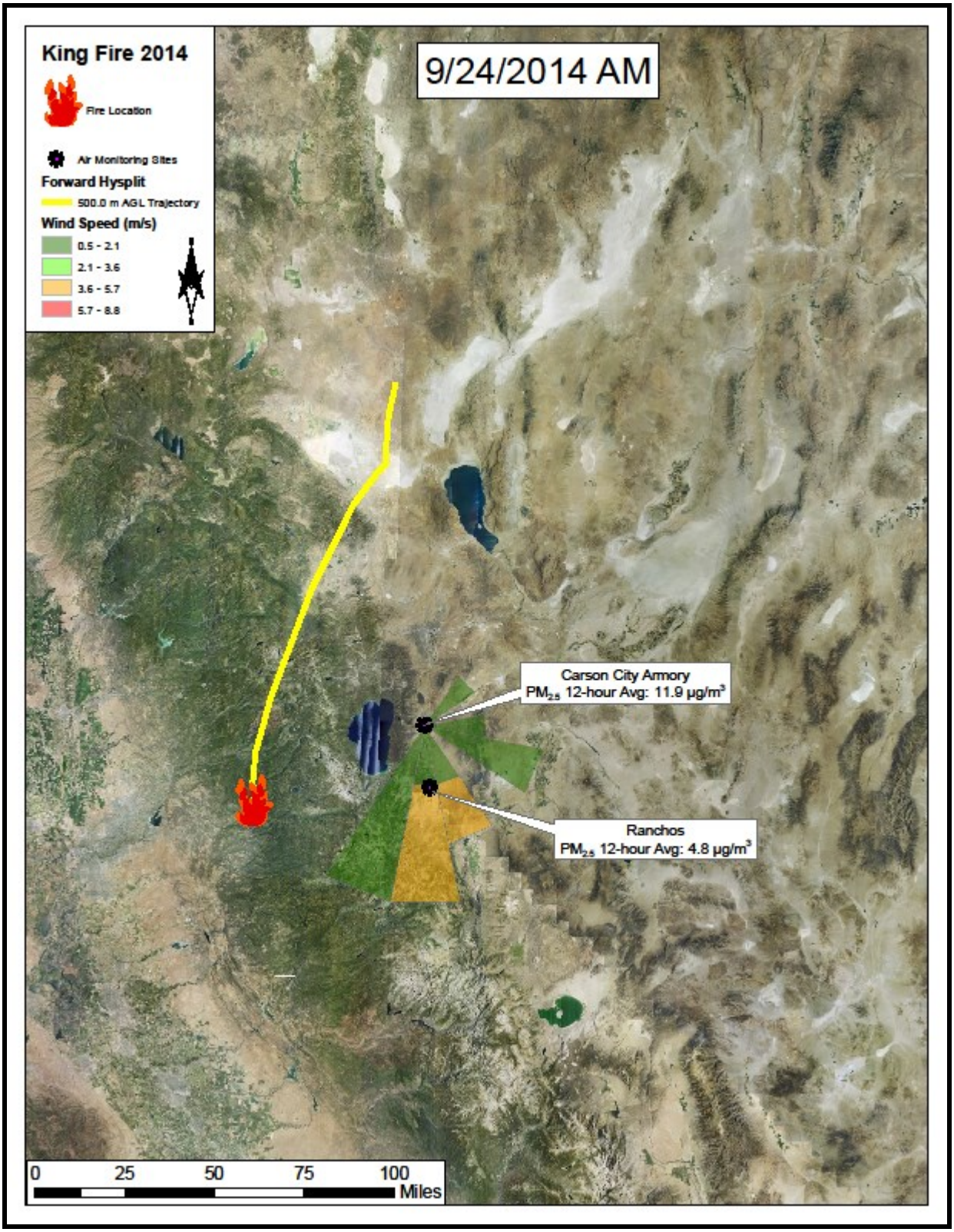


Figure 18 Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 24, 2014, 0000 to 1159 PST.

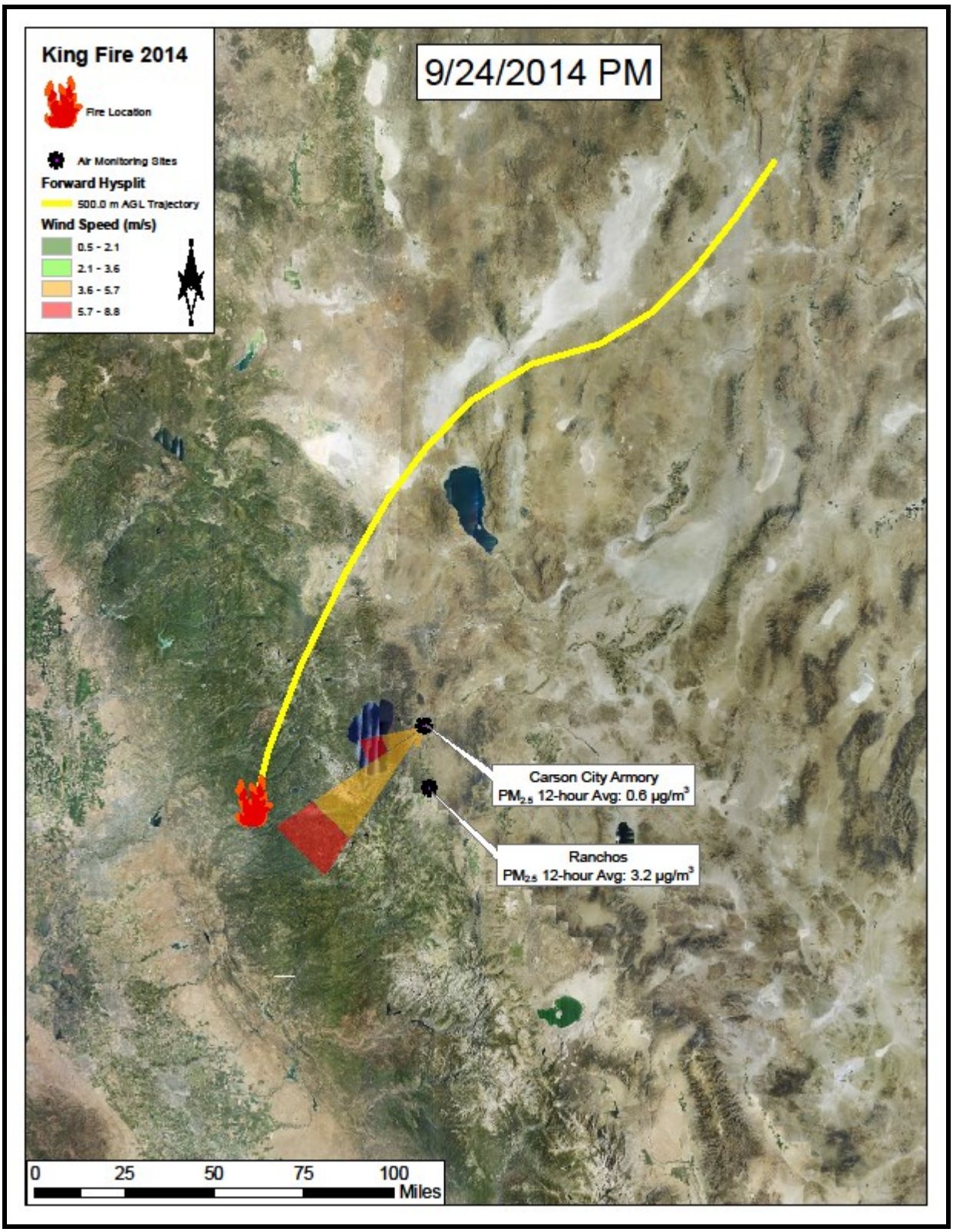


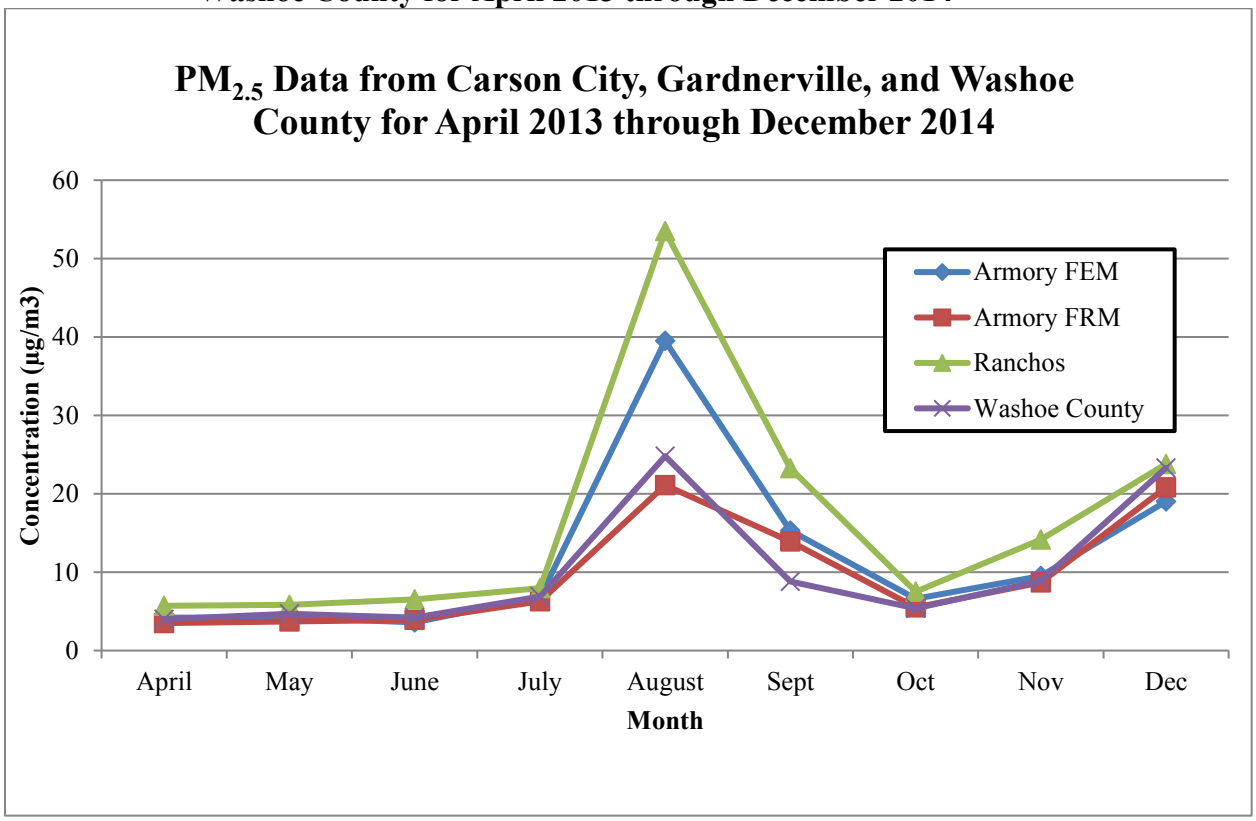
Figure 19 Wind Rose and 12-hour Average $PM_{2.5}$ Concentrations for the CC Armory and Ranchos Monitoring Sites, and HYSPLIT Forward Trajectory (500 m agl) from the King Fire for September 24, 2014, 1200 to 2359 PST.

Figures 4 through 19 show a strong correlation between $PM_{2.5}$ concentration, wind speed and direction, and particle trajectories on days with elevated $PM_{2.5}$ concentrations at the CC Armory and Ranchos air monitoring sites during the King Fire.

2.6 Beyond Historical and Background Concentrations

$PM_{2.5}$ concentrations in western Nevada have been historically low during the summer months. Both the Ranchos and the CC Armory FEM $PM_{2.5}$ monitoring sites were installed in April 2013. As such, three years of historical data is not available for either site. Existing data for both sites was compared to data from Washoe County, Nevada FRM $PM_{2.5}$ monitoring sites approximately 30 miles to the north; the data are similar (Figure 20).

Figure 20 Comparison of $PM_{2.5}$ Values Between Carson City, Gardnerville, and Washoe County for April 2013 through December 2014

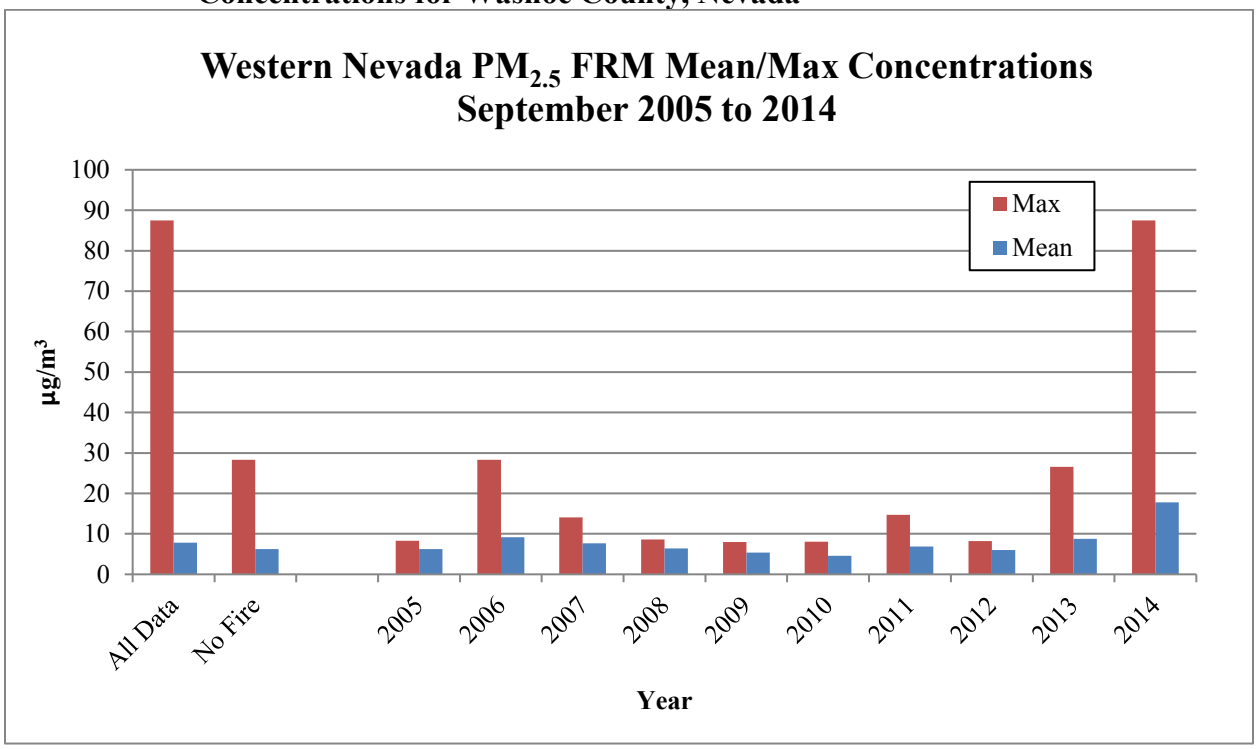


Historical data from Washoe County, Nevada approximately 30 miles to the north of Carson City, show that the average $PM_{2.5}$ concentration for September from 2005 through 2014, (excluding dates that were affected by smoke from the Rim and King fires) is 6.1 $\mu g/m^3$. When the data from the Rim and King fires are included, the average for September increases to 7.9 $\mu g/m^3$. This data is summarized in Table 3 and shown graphically in Figure 21.

Table 3 September $PM_{2.5}$ Statistics for Washoe County, Nevada

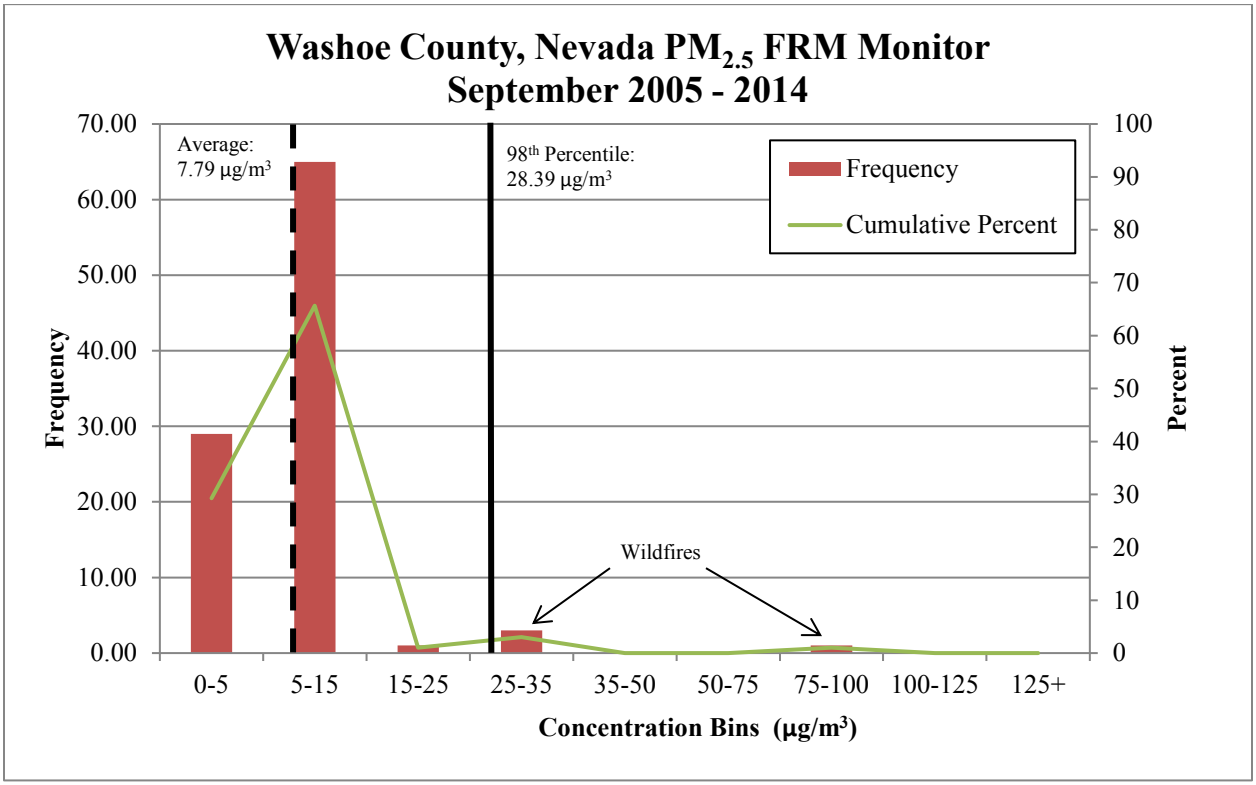
	2005-2014		2005	2006	2007	2008	2009	2010	2011	2012	2013		2014	
	All Data	No Fire									All Data	No Fire	All Data	No Fire
Mean	7.9	6.1	6.3	9.2	7.7	6.4	5.4	4.6	6.9	6.0	8.8	3.8	17.8	4.6
Median	6.0	5.9	6.4	7.0	6.7	6.4	5.8	4.4	5.8	6.1	4.9	4.0	5.8	5.0
Mode	N/A	N/A	N/A	N/A	N/A	N/A	5.9	N/A	N/A	N/A	N/A	N/A	5.0	5.0
Std Dev	8.0	1.8	1.5	7.0	3.4	1.6	1.5	1.8	3.0	1.4	8.7	1.5	27.5	1.2

Figure 21 Historical Data – September $PM_{2.5}$ FRM Mean and Maximum Concentrations for Washoe County, Nevada



Since 2005, exceedances of the NAAQS at the Washoe County, Nevada FRM monitoring site have occurred twice during September; these exceedances occurred during the Rim and King fires in September 2013 and September 2014 (Figure 22).

Figure 22 Historical September $PM_{2.5}$ Concentrations in Washoe County, Nevada



2.7 No Exceedance But For the Event

Smoke from the King Fire contributed to the $PM_{2.5}$ concentration in Carson City and Gardnerville from September 14 through 24, 2014. An estimate of the $PM_{2.5}$ mass contributed by the fire at both sites is shown in Table 4. Based on historical data from 2005 through 2014, normal $PM_{2.5}$ concentrations in western Nevada during September range from 4.6 to 9.2 µg/m^3. Following USEPA methodology (EPA, 2009), NDEP estimates that the King Fire contributed an additional 18.3 to 43.6 µg/m^3 of $PM_{2.5}$ to the Carson City and Gardnerville monitoring sites.

Table 4 Estimate of $PM_{2.5}$ Concentration But For the Event

Site	Average Event Day Concentration[1]	September Average (2005-2014)[2]	September 98th Percentile (2005-2014)[2]	Estimated Contribution of Event
Ranchos	51.4 µg/m^3	7.8 µg/m^3	28.4 µg/m^3	23.0 – 43.6 µg/m^3
CC Armory	46.7 µg/m^3			18.3 – 38.9 µg/m^3

[1] Event days are September 18-19 and 21-23, 2014 for the CC Armory site and September 18-19 and 22-23, 2014 for the Ranchos site.
[2] Washoe County $PM_{2.5}$ FRM data

To NDEP's knowledge, there were no other unusual local $PM_{2.5}$ emissions immediately before or during the King Fire. There were no significant fireworks activities and no prescribed burning in the region. But for the $PM_{2.5}$ contribution from the smoke from the King Fire, there would not have been an exceedance of $PM_{2.5}$ NAAQS for either site.

3.0 CONCLUSIONS

This report documents and provides analysis demonstrating that the King Fire meets the criteria for an exceptional event.

The King Fire was not reasonably controllable or preventable because the fire (and associated smoke) was caused by unauthorized human activity (arson). Due in part to a weather pattern that is common for this time of year, smoke from the fire extended to the north-northeast and impacted western Nevada from September 14 through 24, 2014. Details of the smoke impacts are shown in examples of news releases and NOAA Smoke Text Products, included in Appendix E.

There is a clear causal connection between the smoke from the King Fire and the $PM_{2.5}$ exceedances in Carson City and Gardnerville. Air particle trajectories, wind roses, and satellite imagery of the smoke plume for each exceedance day from September 14 through 24, 2014 show a clear relationship between the smoke and the $PM_{2.5}$ concentrations at the Ranchos and CC Armory monitoring sites.

The average $PM_{2.5}$ concentration for the month of September in western Nevada without fire data is 6.1 $\mu g/m^3$. The average of the 24-hour averages in Carson City and Gardnerville during the King Fire were 46.7 and 51.4 $\mu g/m^3$, respectively; this is approximately eight times the normal level for the region, and well beyond normal historical background levels.

Concentrations of $PM_{2.5}$ at both monitoring sites for the weeks before and after the smoke impacts from the King Fire were close to historical averages for western Nevada. Smoke from the King Fire contributed an estimated 18 to 43 $\mu g/m^3$ to $PM_{2.5}$ concentrations in Carson City and Gardnerville. But for the smoke from the King Fire, $PM_{2.5}$ levels at the Ranchos and CC Armory monitoring sites would have been below the NAAQS.

4.0 PROCEDURAL REQUIREMENTS

4.1 FLAGGING OF DATA

The NDEP BAQP has submitted the $PM_{2.5}$ data from the Carson City and Gardnerville monitors to the USEPA AQS database and has placed the appropriate flags on the data indicating that the data was affected by exceptional events due to wild fires (Flag RT, requesting exclusion due to wildland fires). Informational flags (IT) were also included for other monitored criteria pollutants at each site. Such flagging ensures that the air quality data is properly represented in the overall air quality planning process.

4.2 PUBLIC OUTREACH DURING EVENT

A state requesting exclusion of air quality data affected by an exceptional event must take appropriate and reasonable actions to protect public health from exceedances or violations of the national ambient air quality standards. At a minimum, the state must:

- Provide for prompt public notification whenever air quality concentrations exceed or are expected to exceed an applicable ambient air quality standard;
- Provide for public education concerning actions that individuals may take to reduce exposures to unhealthy levels of air quality during and following an exceptional event; and
- Provide for the implementation of appropriate measures to protect public health from exceedances or violations of ambient air quality standards caused by exceptional events.

The public was notified of air quality being affected by smoke from the King Fire via Air Quality Index (AQI) updates and National Weather Service Smoke Text Products (Appendix E). A health advisory was issued through cooperation between the NDEP and the Nevada Division of Public and Behavioral Health. Douglas County and Carson City citizens, visitors, and school district and county personnel were directed to the NDEP website to monitor particulate matter and to check correlating health advisories. Individuals were advised to call their health care professional if they had any health questions or concerns.

The health advisory as well as sample public notifications for smoke impacts are provided in Appendix E.

4.3 PUBLIC COMMENT PERIOD

The NDEP BAQP has prepared this documentation to demonstrate that these exceedances were due to wildland fire natural events, in accordance with the USEPA Exceptional Event Rule. The documentation in support of this demonstration and request for the treatment of the data associated with these exceedances as exceptional events was posted on the NDEP website at

http://ndep.nv.gov/admin/public.htm requesting review and comment by the public for a minimum of 30 days. Public comments were directed to:

Sheryl Fontaine, Ambient Air Monitoring Branch
Nevada Division of Environmental Protection
Bureau of Air Quality Planning
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701
Email: sfontaine@ndep.nv.gov

5.0 REFERENCES

NOAA National Centers for Environmental Information, State of the Climate: Drought for Annual 2014, published online January 2015, retrieved on January 27, 2016 from http://www.ncdc.noaa.gov/sotc/drought/201413.

NWS (National Weather Service), 2016. Chris Smallcomb, NWS Meteorologist; Personal Communication via electronic mail with Sheryl Fontaine, February 24, 2016.

United States Environmental Protection Agency. 2009. Presenting Evidence to Justify Data Exclusion as an Exceptional Event. Presentation at WESTAR State/EPA Exceptional Events Implementation Meeting. February 25-26, 2009. 32pp.

APPENDIX A

NDEP BAQP Annual Network Plan Approval Letter

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

OCT 26 2016

Mr. Danilo Dragoni
Chief, Bureau of Air Quality Planning
Nevada Division of Environmental Protection
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701

Dear Mr. Dragoni:

Thank you for your submission of the 2016 *Ambient Air Monitoring Network* Plan for the State of Nevada in June 2016. We have reviewed the submitted document based on the requirements set forth under 40 CFR 58. Based on the information provided in the plan, the U.S. Environmental Protection Agency (EPA) approves all portions of the network plan except those specifically identified below.

Please note that we cannot approve portions of the annual network plan for which the information in the plan is insufficient to judge whether the requirement has been met, or for which the information, as described, does not meet the requirements as specified in 40 CFR 58.10 and the associated appendices. EPA Region 9 also cannot approve portions of the plan for which the EPA Administrator has not delegated approval authority to the regional offices. Accordingly, the first enclosure (*A. Annual Monitoring Network Plan Items where EPA is Not Taking Action*) provides a listing of specific items of your agency's annual monitoring network plan where EPA is not taking action. The second enclosure (*B. Additional Items Requiring Attention*) is a listing of additional items in the plan that EPA wishes to bring to your agency's attention.

The third enclosure (*C. Annual Monitoring Network Plan Checklist*) is the checklist EPA used to review your plan for overall items that are required to be included in the annual network plan along with our assessment of whether the plan submitted by your agency addresses those requirements.

The first two enclosures highlight a subset of the more extensive list of items reviewed in the third enclosure. All comments conveyed via this letter (and enclosures) should be addressed (through corrections within the plan, additional information being included, or discussion) in next year's annual monitoring network plan.

If you have any questions regarding this letter or the enclosed comments, please feel free to contact me at (415) 947-4134 or Anna Mebust at (415) 972-3265.

Sincerely,

Gwen Yoshimura, Acting Manager
Air Quality Analysis Office

Enclosures:

A. Annual Monitoring Network Plan Items where EPA is Not Taking Action
B. Additional Items Requiring Attention
C. Annual Monitoring Network Plan Checklist

cc (via email): Daren Winkelman, NDEP

A. Annual Monitoring Network Plan Items where EPA is Not Taking Action

We are not acting on the portions of annual network plans where either EPA Region 9 lacks the authority to approve specific items of the plan, or EPA has determined that a requirement is either not met or information in the plan is insufficient to judge whether the requirement has been met.

- System modifications (e.g., site closures or moves) are subject to approval per 40 CFR 58.14(c). Information provided in the plan was insufficient for EPA to approve the system modifications listed in the plan per the applicable requirement. Therefore, we are not acting on the following items as part of this year's annual network plan (see Checklist Row 3):
    - Shutdown of Harvey CO SLAMS monitor
- EPA identified items in your agency's annual monitoring network plan where a requirement was not being met or information in the plan was insufficient to judge whether the requirement was being met based on 40 CFR 58.10 and the associated appendices. Therefore, we are not acting on the following items:

Item	Checklist Row	Issue
Modifications to SLAMS network	3	Insufficient information to judge
Minimum # of monitoring sites for $PM_{2.5}$	23	Insufficient information to judge
Minimum # of monitoring sites for PM_{10}	37	Insufficient information to judge
Minimum # of monitoring sites for O_3	53	Insufficient information to judge
NO_2-specific monitoring requirements	56-60	Insufficient information to judge
Minimum monitoring requirement for near-road CO monitor	61	Insufficient information to judge
Monitors used to meet Data Requirements Rule	63	Insufficient information to judge
Requirements for continuous $PM_{2.5}$ monitoring	24	Insufficient information to judge
Monitor type and Network Affiliations	72	Incorrect in one instance
Scale of representativeness for each monitor	73	Incorrect in one instance
Distance from supporting structure	81	Insufficient information to judge
Distance from obstructions not on roof	83	Insufficient information to judge

Statement regarding SPMs that meet Appendix E also meet either Appendix A or an approved alternative	14	Insufficient information to judge

Additional information for each of these items may be found for the row listed in column 2, in the third enclosure (*C. Annual Monitoring Network Plan Checklist).*

B. Additional Items Requiring Attention

- NDEP's minimum monitoring requirements are provided in a single table for all pollutants. In several instances the information provided was insufficient to judge whether minimum requirements were being met. The information needed to judge whether minimum monitoring requirements are met varies between each pollutant and can be challenging to present in a single table covering all pollutants. EPA Region 9 shares example minimum monitoring requirement tables that clearly identify the information needed for each pollutant. Please consider using these example tables in future plans to ensure there is sufficient information to judge whether requirements are being met.

- [Item 2] The Cover Letter states that the plan was posted for public comment for 30 days; however, specific dates were not provided. Please provide the specific dates of the public comment period in next year's plan or cover letter.

- [Item 12] 40 CFR 58.16(a) requires precision/accuracy reports to be submitted to AQS on a quarterly basis. The plan indicates that reports were submitted to AQS by January 2016. Please update next year's plan with a statement to verify that reports are submitted quarterly, as per the requirement.

- [Item 25] While this information is provided elsewhere in the plan, the information on collocation in Table 2 is presented in a confusing manner. The table as provided lists method codes for both primary and collocated monitors. As presented, it appears that an FEM is collocated with another FEM and an FRM is collocated with another FRM. The table also does not provide information on collocation throughout the network, as there are two monitors in the network with method code 170 and the table only includes one of those monitors.

  Please update this table in next year's plan. If you need further clarification on how to clearly present the collocation information in the table, please contact EPA Region 9 staff.

- [Item 65] Please correct the typo on the top of page 14 (Elko Site Description) for the 723 Railroad Street site from "32-007-003" to "32-007-0003."

- [Item 74] There is a table display error in the Fallon detailed site information table that caused the Pollutant/POC information to be separated from the other monitor-specific information. Please fix this error in next year's plan.

  In last year's ANP review, we commented that the Jarbidge Wilderness IMPROVE should have a parameter code of 88501. The parameter code should actually be 88502, as verified in AQS. Please update this in next year's plan.

C. ANNUAL MONITORING NETWORK PLAN CHECKLIST

(Updated February 10, 2016)

Year: 2016
Agency: Nevada Department of Environmental Protection (NDEP)

40 CFR 58.10(a)(1) requires that each Annual Network Plan (ANP) include information regarding the following types of monitors: SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN stations, State speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, and PAMS stations.

40 CFR 58.10(a)(1) further directs that, "The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable." On this basis, review of the ANPs is based on the requirements listed in 58.10 along with those in Appendices A, C, D, and E.

EPA Region 9 will not take action to approve or disapprove any item for which Part 58 grants approval authority to the Administrator rather than the Regional Administrators, but we will do a check to see if the required information is included and correct. The items requiring approval by the Administrator are: PAMS, NCore, and Speciation (STN/CSN).

Please note that this checklist summarizes many of the requirements of 40 CFR Part 58, but does not substitute for those requirements, nor do its contents provide a binding determination of compliance with those requirements. The checklist is subject to revision in the future and we welcome comments on its contents and structure.

Key:

White	meets the requirement
Yellow	requirement is not met, or information is insufficient to make a determination. Action requested in next year's plan or outside the ANP process (items listed in Enclosure A).
Green	item requires attention in order to improve next year's plan (items listed in Enclosure B).

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
GENERAL PLAN REQUIREMENTS					
1.	Submit plan by July 1st	58.10 (a)(1)	Yes	Yes	
2.	30-day public comment / inspection period[6]	58.10 (a)(1), 58.10 (a)(2)	Yes, Cover Letter	Yes	The Cover Letter states that the plan was posted for public comment for 30 days; however, specific dates were not provided. Please provide the specific dates of the public comment period in next year's plan or cover letter. No comments were received.
3.	Modifications to SLAMS network – case when we are not approving system modifications	58.10 (a)(2) 58.10 (b)(5) 58.10(e) 58.14	Yes, pages 8-10	Insufficient to judge	EPA will not be approving the following modifications as part of the 2016 ANP review: • Shutdown of Harvey CO SLAMS
4.	Modifications to SLAMS network – case when we are approving system modifications per 58.14	58.10 (a)(2) 58.10 (b)(5) 58.10(e) 58.14	NA	NA	
5.	Does plan include documentation (e.g., attached approval letter) for system modifications that have been approved since last ANP approval?		NA	NA	
6.	Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal	58.10 (b)(5)	Yes, pages 8-10, Detailed Site Info	Yes	See checklist item #3.
7.	A plan for establishing a near-road $PM_{2.5}$ monitor (in CBSAs $\geq$ 2.5 million) by 1/1/2015 **(plan was due July 1, 2014)**	58.10(a)(8)(i)	NA	NA	None required

[1] Unless otherwise noted.
[2] Response options: NA (Not Applicable), Yes, No, Incomplete, Incorrect. The responses "Incomplete" and "Incorrect" assume that some information has been provided.
[3] To the best of our knowledge.
[4] Assuming the information is correct
[5] Response options: NA (Not Applicable) – [reason], Yes, No, Insufficient to Judge.
[6] The affected state or local agency must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan.

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
8.	A plan for establishing a near-road $PM_{2.5}$ monitor (in CBSAs ≥ 1 million and ≤ 2.5 million) by 1/1/2017 **(plan due July 1, 2016)**	58.10(a)(8)(ii)	NA	NA	None required
9.	A plan for establishing a near-road CO monitor (in CBSAs ≥ 2.5 million) by 1/1/2015 **(plan was due July 1, 2014)**	58.10(a)(7) 58.13(e)(1)	NA	NA	None required
10.	A plan for establishing a near-road CO monitor (in CBSAs ≥ 1 million and ≤ 2.5 million) by 1/1/2017 **(plan due July 1, 2016)**	58.10(a)(7) 58.13(e)(1)	NA	NA	None required
11.	NO_2 plan for establishment of 2nd near-road monitor by 1/1/2015 **(plan was due July 1, 2014)**	58.10 (a)(5)(iv)	NA	NA	None required
12.	Precision/Accuracy reports submitted to AQS	58.16(a); App A, 1.3 and 5.1.1	Yes, page 3	Yes	40 CFR 58.16(a) requires precision/accuracy reports to be submitted to AQS on a quarterly basis. The plan indicates that reports were submitted to AQS by January 2016. Please update next year's plan with a statement to verify that reports are submitted quarterly, as per the requirement.
13.	Annual data certification submitted	58.15 App. A 1.3	Yes, pages 2-3	Yes	
14.	Statement that SPMs operating an FRM/FEM/ARM that meet Appendix E also meet either Appendix A or an approved alternative. Documentation for any Appendix A approved alternative should be included.[7]	58.11 (a) (2)	No	Insufficient to judge	A statement is required to indicate whether the Ranchos Aspen Park $PM_{2.5}$ SPM meets the requirements of Appendix E and Appendix A or an approved alternative.
15.	SPMs operating FRM/FEM/ARM monitors for over 24 months are listed as comparable to the NAAQS or the agency provided documentation that requirements from Appendices A, C, or E were not met.[8]	58.20(c)	Yes, page 38	Yes	
16.	For agencies that share monitoring responsibilities in an MSA/CSA: this agency meets full monitoring requirements or an agreement between the affected	App D 2(e)	NA	NA	

[7] Alternatives to the requirements of appendix A may be approved for an SPM site as part of the approval of the annual monitoring plan, or separately.

[8] This requirement only applies to monitors that are eligible for comparison to the NAAQS per 40 CFR §§58.11(e) and 58.30.

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
	agencies and the EPA Regional Administrator is in place				
GENERAL PARTICULATE MONITORING REQUIREMENTS (PM_{10}, $PM_{2.5}$, Pb-TSP, Pb-PM_{10})					
17.	Designation of a primary monitor if there is more than one monitor for a pollutant at a site.	Need to determine collocation	Yes, page 23	Yes	
18.	Distance between QA collocated monitors (Note: waiver request or the date of previous waiver approval must be included if the distance deviates from requirement.)	App. A 3.2.5.6 and 3.2.6.3	Yes, page 24	Yes	
19.	For low volume PM instruments (flow rate < 200 liters/minute), all other PM instruments are > 1 m from the lovol. If no, list distance (meters) and instruments.	App E	Yes, Detailed Site Info	Yes	
20.	For high volume PM instruments (flow rate > 200 liters/minute), all other PM instruments are > 2m from the hivol. If no, list distance (meters) and instruments.	App E	NA	NA	
$PM_{2.5}$ –SPECIFIC MONITORING REQUIREMENTS					
21.	Document how states and local agencies provide for the review of changes to a $PM_{2.5}$ monitoring network that impact the location of a violating $PM_{2.5}$ monitor.	58.10 (c)	Yes, page 8	Yes	
22.	Identification of any $PM_{2.5}$ FEMs and/or ARMs not eligible to be compared to the NAAQS due to poor comparability to FRM(s) [Note 1: must include required data assessment.] [Note 2: Required SLAMS must monitor $PM_{2.5}$ with NAAQS-comparable monitor at the required sample frequency.]	58.10 (b)(13) 58.11 (e)	NA	NA	
23.	Minimum # of monitoring **sites** for $PM_{2.5}$ [Note 1: should be supported by MSA ID, MSA population, DV, # monitoring sites, and # required monitoring sites] [Note 2: Only monitors considered to be	App D, 4.7.1(a) and Table D-5	Yes	Insufficient to judge	Population provided is county population, not MSA population, which determines minimum monitoring requirements. MSA population is needed to determine whether minimum monitoring requirements are being met.

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
	required SLAMs are eligible to be counted towards meeting minimum monitoring requirements.]				The table lists the minimum number of required monitors for the Gardnerville Ranchos MSA as 0-1. Since the population of the Gardnerville Ranchos MSA is <50,000, the minimum number of required monitors is 0. Please update this in next year's plan. There is no need to list the CSAs in the minimum monitoring requirement table. This information can be removed in next year's plan. Also, please note that when design values are available for the new $PM_{2.5}$ monitors, the minimum monitoring requirements table will need to include both annual and 24-hour design values.
24.	Requirements for continuous $PM_{2.5}$ monitoring (number of monitors and collocation)	App D 4.7.2	No	Insufficient to judge	Information regarding continuous $PM_{2.5}$ monitoring requirements listed in 40 CFR 58 Appendix D 4.7.2 was not provided.
25.	FRM/FEM/ARM $PM_{2.5}$ QA collocation	App A 3.2.5	Yes, Detailed Site Info	Yes	While this information is provided elsewhere in the plan, the information on collocation in Table 2 is presented in a confusing manner. The table as provided lists method codes for both primary and collocated monitors. As presented, it appears that an FEM is collocated with another FEM and an FRM is collocated with another FRM. The table also does not provide information on collocation throughout the network, as there are two monitors in the network with method code 170 and the table only includes one of those monitors. Please update this table in next year's plan. If you need further clarification on how to clearly present the collocation information in the table, please contact EPA Region 9 staff.
26.	$PM_{2.5}$ Chemical Speciation requirements for official STN sites	App D 4.7.4	NA	NA	

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
27.	Identification of sites suitable and sites not suitable for comparison to the annual $PM_{2.5}$ NAAQS as described in Part 58.30	58.10 (b)(7)	Yes, Detailed Site Info	Yes	
28.	Required $PM_{2.5}$ sites represent area-wide air quality	App D 4.7.1(b)	Yes, Detailed Site Info	Yes	
29.	For $PM_{2.5}$, within each MSA, at least one site at neighborhood or larger scale in an area of expected maximum concentration	App D 4.7.1(b)(1)	Yes, page 23	Yes	Currently no $PM_{2.5}$ monitoring is required, so a maximum concentration site is not required. However, when design values become available for the new sites, a maximum concentration site may become required in the Carson City MSA. The $PM_{2.5}$ monitor at Carson City Armory is listed as a "highest concentration" site type.
30.	Minimum monitoring requirement for near-road $PM_{2.5}$ monitor (in CBSA $\geq$ 2.5 million) by 1/1/2015	58.13(f)(1) App D 4.7.1(b)(2)	NA	NA	
31.	If additional SLAMS $PM_{2.5}$ is required, there is a site in an area of poor air quality	App D 4.7.1(b)(3)	NA	NA	No required SLAMS
32.	States must have at least one $PM_{2.5}$ regional background and one $PM_{2.5}$ regional transport site.	App D 4.7.3	Yes, page 41	Yes	NDEP uses the Jarbidge Wilderness IMPROVE site to meet this requirement.
33.	Sampling schedule for $PM_{2.5}$ - applies to year-round and seasonal sampling schedules (note: date of waiver approval must be included if the sampling season deviates from requirement)	58.10 (b)(4) 58.12(d) App D 4.7 EPA flowchart	Yes, Detailed Site Info	Yes	
34.	Frequency of flow rate verification for manual $PM_{2.5}$ monitors audit	App A 3.3.2	Yes, Detailed Site Info	Yes	
35.	Frequency of flow rate verification for automated $PM_{2.5}$ monitors audit	App A 3.2.3	Yes, Detailed Site Info	Yes	
36.	Dates of two semi-annual flow rate audits conducted in **CY2015** for $PM_{2.5}$ monitors	App A, 3.2.4 and 3.3.3	Yes, Detailed Site Info	Yes	
PM_{10} –SPECIFIC MONITORING REQUIREMENTS					
37.	Minimum # of monitoring sites for PM_{10} [Note: Only monitors considered to be required SLAMs are eligible to be counted towards meeting minimum monitoring requirements.]	App D, 4.6 (a) and Table D-4	Yes, page 7	Insufficient to judge	Population provided is county population, not MSA population, which determines minimum monitoring requirements. MSA population is needed to

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
					determine whether minimum monitoring requirements are being met. The plan provides design values for PM10 instead of maximum concentrations. Maximum concentrations are needed to determine whether minimum monitoring requirements are being met. Minimum monitoring requirements for PM_{10} described in 40 CFR 58 Appendix D apply only to Metropolitan Statistical Areas. Please correct the information in your next plan to evaluate the requirement for each area separately, and indicate that there are no sites required in Micropolitan Statistical Areas. The plan indicates that four monitors are required in Pahrump by an MOU. This is good information to include in the plan, but was not the intent of evaluating the network requirements of 40 CFR 58 Appendix D. As such, they should not be included as required monitors in the minimum monitoring requirements table (i.e. the "minimum # of monitors required" should be 0 in the table). There is no need to list the CSAs in the minimum monitoring requirement table. This information can be removed in next year's plan.
38.	Manual PM_{10} method collocation (note: continuous PM_{10} does not have this requirement)	App A 3.3.1	NA	NA	No manual PM_{10} monitors.
39.	Sampling schedule for PM_{10}	58.10 (b)(4) 58.12(e) App D 4.6	Yes, Detailed Site Info	Yes	All PM_{10} monitors are continuous.
40.	Frequency of flow rate verification for manual PM_{10} monitors audit	App A 3.3.2	NA	NA	

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
41.	Frequency of flow rate verification for automated PM_{10} monitors audit	App A 3.2.3	Yes, Detailed Site Info	Yes	
42.	Dates of two semi-annual flow rate audits conducted in **CY2015** for PM_{10} monitors	App A, 3.2.4 and 3.3.3	Yes, Detailed Site Info	Yes	
Pb –SPECIFIC MONITORING REQUIREMENTS					
43.	Minimum # of monitors for non-NCore Pb [Note: Only monitors considered to be required SLAMs are eligible to be counted towards meeting minimum monitoring requirements.]	App D 4.5 58.13(a)	Yes, page 5	Yes	No monitoring required.
44.	Pb collocation: for non-NCore sites	App A 3.3.4.3	NA	NA	
45.	Any source-oriented Pb site for which a waiver has been granted by EPA Regional Administrator	58.10 (b)(10)	NA	NA	
46.	Any Pb monitor for which a waiver has been requested or granted by EPA Regional Administrator for use of Pb-PM_{10} in lieu of Pb-TSP	58.10 (b)(11)	NA	NA	
47.	Designation of any Pb monitors as either source-oriented or non-source-oriented	58.10 (b)(9)	NA	NA	
48.	Sampling schedule for Pb	58.10 (b)(4) 58.12(b) App D 4.5	NA	NA	
49.	Frequency of flow rate verification for Pb monitors audit	App A 3.3.4.1	NA	NA	
50.	Dates of two semi-annual flow rate audits conducted in **CY2015** for Pb monitors	App A 3.3.4.1	NA	NA	
GENERAL GASEOUS MONITORING REQUIREMENTS					
51.	Frequency of one-point QC check (gaseous)	App. A 3.2.1	Yes, Detailed Site Info	Yes	
52.	Date of Annual Performance Evaluation (gaseous) conducted in **CY2015**	App. A 3.2.2	Yes, Detailed Site Info	Yes	
O_3 –SPECIFIC MONITORING REQUIREMENTS					
53.	Minimum # of monitoring sites for O_3 [Note 1: should be supported by MSA ID, MSA population, DV, # monitoring sites, and # required monitoring	App D, 4.1(a) and Table D-2	Yes	Insufficient to Judge	Population provided is county population, not MSA population, which determines minimum monitoring requirements. MSA population is needed to

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
	sites] [Note 2: Only monitors considered to be required SLAMs are eligible to be counted towards meeting minimum monitoring requirements.] [Note 3: monitors that do not meet traffic count/distance requirements to be neighborhood or urban scale (40 CFR Appendix E, Table E-1) cannot be counted towards meeting minimum monitoring requirements]				determine whether minimum monitoring requirements are being met. Minimum monitoring requirements for ozone described in 40 CFR 58 Appendix D apply only to MSAs with populations above 50,000. Based on the populations and design values, one ozone site is required in the Carson City MSA and one ozone site is required in the Fernley MSA. Please correct the information in your next plan to evaluate the requirement for each area separately, and indicate that there are no sites required in the Fallon Micropolitan Statistical Area. There is no need to list the CSAs in the minimum monitoring requirement table. This information can be removed in next year's plan.
54.	Identification of maximum concentration O_3 site(s)	App D 4.1 (b)	Yes, page 23	Yes	Carson City Armory is listed as the maximum ozone concentration site.
55.	Sampling season for O_3 (Note: Waivers must be renewed annually. EPA expects agencies to submit re-evaluations of the relevant data each year with the ANP. EPA will then respond as part of the ANP response.)	58.10 (b)(4) App D, 4.1(i)	Yes, Detailed Site Info	Yes, Detailed Site Info	All sites monitor ozone year-round.
NO_2 –SPECIFIC MONITORING REQUIREMENTS					
56.	Minimum monitoring requirement for single near-road NO_2 monitor (in CBSA ≥ 1 million) by 1/1/2014 [Note: Only monitors considered to be required SLAMs are eligible to be counted towards meeting minimum monitoring requirements.]	58.13(c)(3) App D 4.3.2	No	Insufficient to Judge	No information was provided on minimum monitoring requirements for near-road or area-wide NO_2 beyond the table stating that the required number of NO_2 monitors is 0.
57.	Minimum monitoring requirement for second near-road NO_2 monitor (in CBSA ≥ 2.5 million) by 1/1/2015 [9] [Note: Only monitors considered to be	58.13(c)(4) App D 4.3.2	No	Insufficient to Judge	See checklist item #56.

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
	required SLAMs are eligible to be counted towards meeting minimum monitoring requirements.]				
58.	Minimum monitoring requirements for area-wide NO_2 monitor in location of expected highest NO_2 concentrations representing neighborhood or larger scale (operation required by January 1, 2013)[9]	App D 4.3.3	No	Insufficient to Judge	See checklist item #56.
59.	Minimum monitoring requirements for susceptible and vulnerable populations monitoring (aka RA40) NO_2 (operation required by January 1, 2013)[9]	App D 4.3.4	No	Insufficient to Judge	See checklist item #56.
60.	Identification of required NO_2 monitors as either near-road, area-wide, or vulnerable and susceptible population (aka RA40)	58.10 (b)(12)	No	Insufficient to Judge	See checklist item #56.
CO –SPECIFIC MONITORING REQUIREMENTS					
61.	Minimum monitoring requirement for near-road CO monitor (in CBSA ≥ 2.5 million) by 1/1/2015[9]	58.13(e)(1) App D 4.2.1	No	Insufficient to Judge	No information was provided on minimum monitoring requirements for CO.
SO_2 –SPECIFIC MONITORING REQUIREMENTS					
62.	Minimum monitoring requirements for SO_2 based on PWEI and/or RA required monitors under Appendix D 4.4.3 [Note: Only monitors considered to be required SLAMs are eligible to be counted towards meeting minimum monitoring requirements.]	App D 4.4	Yes, page 5	Yes	
63.	Monitors used to meet Data Requirements Rule included in July 1, 2016 ANP (to be installed no later than January 1, 2017).	40 CFR 51.1203(c)	No	Insufficient to Judge	No information was provided on whether monitoring is required by the Data Requirements Rule.
NCORE –SPECIFIC MONITORING REQUIREMENTS					
64.	NCore site and all required parameters operational: year-round O_3, trace SO_2, trace CO, NO_y, NO, $PM_{2.5}$ mass, $PM_{2.5}$ continuous, $PM_{2.5}$ speciation, $PM_{10-2.5}$ mass, resultant wind speed at 10m, resultant wind	58.10 (a)(3); Pb collocation App. A 3.3.4.3; $PM_{10-2.5}$ minimum	NA	NA	

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
	direction at 10m, ambient temperature, relative humidity, and Pb at CBSAs ≥ 500,000.	monitoring App. D 4.8; $PM_{10-2.5}$ sampling schedule 58.10 (b)(4) 58.12(f) App D 4.8; $PM_{10-2.5}$ collocation App. A 3.3.6			
SITE OR MONITOR - SPECIFIC REQUIREMENTS (OFTEN INCLUDED IN DETAILED SITE INFORMATION TABLES)					
65.	AQS site identification number for each site	58.10 (b)(1)	Yes, Detailed Site Info	Yes	Please correct the typo on the top of page 14 (Elko Site Description) for the 723 Railroad Street site from "32-007-003" to "32-007-0003."
66.	Location of each site: street address and geographic coordinates	58.10 (b)(2)	Yes, Detailed Site Info	Yes	
67.	MSA, CBSA, CSA or other area represented by the monitor	58.10 (b)(8)	Yes, Detailed Site Info	Yes	
68.	Parameter occurrence code for each monitor	Needed to determine if other requirements (e.g., min # and collocation) are met	Yes, Detailed Site Info	Yes	
69.	Statement of purpose for each monitor	58.10 (a)(1)	Yes, Detailed Site Info	Yes	
70.	Basic monitoring objective for each monitor	App D 1.1 58.10 (b)(6)	Yes, Detailed Site Info	Yes	
71.	Site type for each monitor	App D 1.1.1	Yes, Detailed Site Info	Yes	

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
72.	Monitor type for each monitor, and Network Affiliation(s) as appropriate	Needed to determine if other requirements (e.g., min # and collocation) are met	Yes, Detailed Site Info	Incorrect in one instance	The monitor type and network affiliations provided for the Jarbidge Wilderness IMPROVE site are incorrect. A network affiliation of "IMPROVE" should be listed for the station (no network affiliations are currently listed. The Monitoring Type should be changed from "Special Purpose" to "EPA."
73.	Scale of representativeness for each monitor as defined in Appendix D	58.10(b)(6); App D	Yes, Detailed Site Info	Incorrect in one instance	Scale of representativeness for PM monitors should be chosen based on distance to the nearest traffic lane and the AADT, as shown in Figure E-1 in 40 CFR 58 Appendix E. The Linda St. PM_{10} monitor is listed as Regional. There are no provisions for a scale of Regional according to Figure E-1 and thus the scale of this site should be Urban.
74.	Parameter code for each monitor	Needed to determine if other requirements (e.g., min # and collocation) are met	Yes, Detailed Site Info	Yes	There is a table display error in the Fallon detailed site information table that caused the Pollutant/POC information to be separated from the other monitor-specific information. Please fix this error in next year's plan. In last year's ANP review, we commented that the Jarbidge Wilderness IMPROVE should have a parameter code of 88501. The parameter code should actually be 88502, as verified in AQS. Please update this in next year's plan.
75.	Method code and description (e.g., manufacturer & model) for each monitor	58.10 (b)(3); App C 2.4.1.2	Yes, Detailed Site Info	Yes	
76.	Sampling start date for each monitor	Needed to determine if other requirements (e.g., min # and	Yes, Detailed Site Info	Yes	

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, page #s. Flag if incorrect[3]?	Does the information provided[4] meet the requirement?[5]	Notes
		collocation) are met			
77.	Distance of monitor from nearest road	App E 6	Yes, Detailed Site Info	Yes	
78.	Traffic count of nearest road	App E	Yes, Detailed Site Info	Yes	
79.	Groundcover	App E 3(a)	Yes, Detailed Site Info	Yes	
80.	Probe height	App E 2	Yes, Detailed Site Info	Yes	
81.	Distance from supporting structure	App E 2	Yes, Detailed Site Info	Insufficient to judge	Vertical distance from supporting structure was not provided for some monitors (Fallon O_3, unclear for all Carson City Armory monitors, unclear for Jarbidge Wilderness IMPROVE site).
82.	Distance from obstructions on roof (horizontal distance to the obstruction and vertical height of the obstruction above the probe should be provided)	App E 4(b)	Yes, Detailed Site Info	Yes	
83.	Distance from obstructions not on roof (horizontal distance to the obstruction and vertical height of the obstruction above the probe should be provided)	App E 4(a)	Yes, Detailed Site Info	Insufficient to judge	Provide vertical heights of obstructions above the probe (and tree height above the probe as trees can act as obstructions) at all sites.
84.	Distance from the drip line of closest tree(s)	App E 5	Yes, Detailed Site Info	Yes	
85.	Distance to furnace or incinerator flue	App E 3(b)	Yes, Detailed Site Info	Yes	
86.	Unrestricted airflow (expressed as degrees around probe/inlet or percentage of monitoring path)	App E, 4(a) and 4(b)	Yes, Detailed Site Info	Yes	
87.	Probe material ($NO/NO_2/NO_y$, SO_2, O_3; For PAMS: VOCs, Carbonyls)	App E 9	Yes, Detailed Site Info	Yes	
88.	Residence time ($NO/NO_2/NO_y$, SO_2, O_3; For PAMS: VOCs, Carbonyls)	App E 9	Yes, Detailed Site Info	Yes	

Public Comments on Annual Network Plan

Were comments submitted to the S/L/T agency during the public comment period?

No

If no, skip the remaining questions.
If yes:

- Were any of the comments substantive?
  - If yes, which ones?
  - Explain basis for determination if any comments were considered not substantive:
- Did the agency respond to the substantive comments?
  - If yes, was the response adequate?
- Do the substantive comments require separate EPA response (i.e., agency response wasn't adequate)?
- Are the sections of the annual network plan that received substantive comments approvable after consideration of comments?
  - If yes, provide rationale:

APPENDIX B
NDEP BAQP 2014 Data Certification Letter

NEVADA DIVISION OF
ENVIRONMENTAL
PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Brian Sandoval, Governor
Leo M. Drozdoff, P.E., Director
Colleen Cripps, Ph.D., Administrator

April 22, 2015

Mr. Jared Blumenfeld
Regional Administrator
U.S. EPA – Region 9
75 Hawthorne Street
San Francisco, CA 94105

RE: Submittal of the State of Nevada 2014 Data Certification Package

Dear Mr. Blumenfeld:

Pursuant to 40 CFR Part 58, state and local government monitoring organizations must annually certify their data. Certification for the year 2014 means that (1) the ambient concentration data and the quality assurance data from January 1, 2014 through December 31, 2014 are completely submitted to the Air Quality System (AQS) by the Nevada Division of Environmental Protection (NDEP), Primary Quality Assurance Organization (PQAO) 0757; and (2) the ambient data are accurate to the best of my knowledge taking into consideration the quality assurance findings. This process has taken into account the results of periodic verification, precision and accuracy checks, and any other relevant performance assessments.

During the 2014 data year, a quality control check showed that the flow rate verification at the Carson City Armory site for the continuous monitor did not meet tolerances. Based on our original data verification, NDEP assigned a Null Data Qualifier code to the affected data. During our Technical Systems Audit with Region 9 USEPA, it was determined that the data may be valid based on other collocated data and metadata. Working with Region 9, we evaluated the data using EPA's comparability tool, collocated data, and the flow data from the affected analyzer. Based on the review of Region 9 and our agency, we are confident the data is suitable for comparison to the NAAQS. Therefore, the data was resubmitted to AQS with an appropriate Quality Assurance Qualifier code.

As Chief of the Bureau of Air Quality Planning for the State of Nevada, I certify that all data from the NDEP State and Local Air Monitoring System (SLAMS) and the Special Purpose Monitor (SPM) included on the AMP 600 summary report, have met the data certification criteria described in 40 CFR Part 58, for the year 2014.

If you have any questions or comments, please contact Daren Winkelman of my staff, at 775-687-9342, or e: dwinkelman@ndep.nv.gov.

Sincerely,

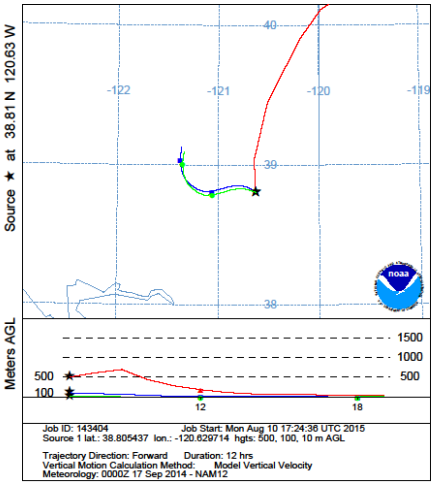
Jasmine Mehta, Chief
Bureau of Air Quality Planning

JKM/dw
Enclosures

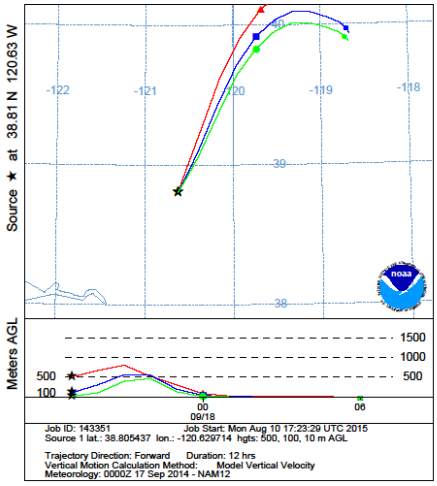
APPENDIX C

HYSPLIT Model Outputs – Forward Trajectories

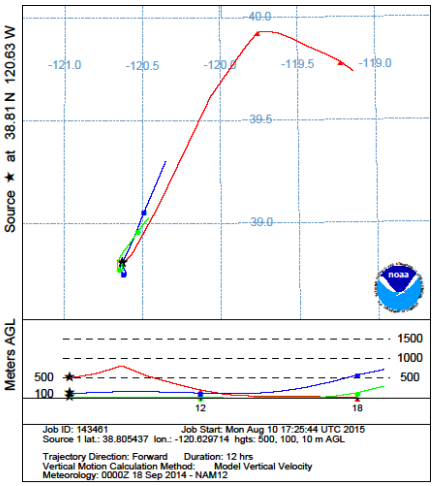
NOAA HYSPLIT MODEL
Forward trajectories starting at 0700 UTC 17 Sep 14
NAM Meteorological Data



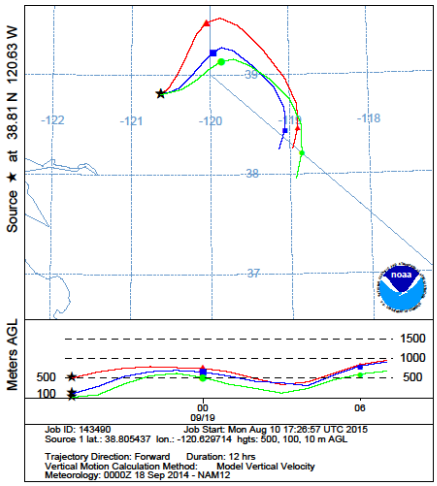
NOAA HYSPLIT MODEL
Forward trajectories starting at 1900 UTC 17 Sep 14
NAM Meteorological Data

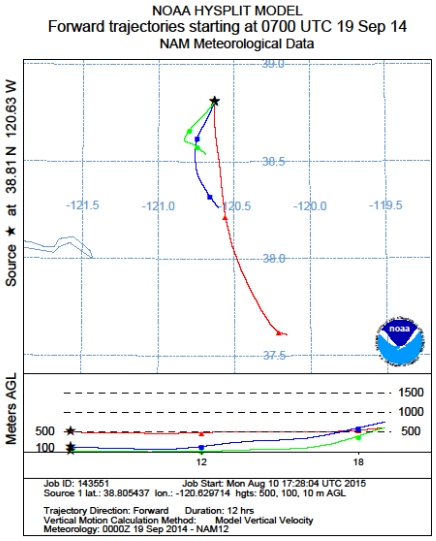


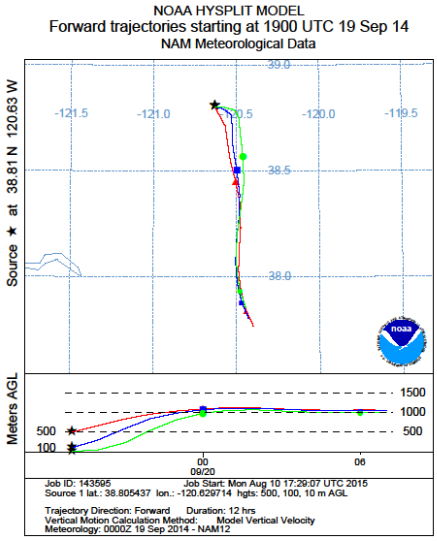
NOAA HYSPLIT MODEL
Forward trajectories starting at 0700 UTC 18 Sep 14
NAM Meteorological Data

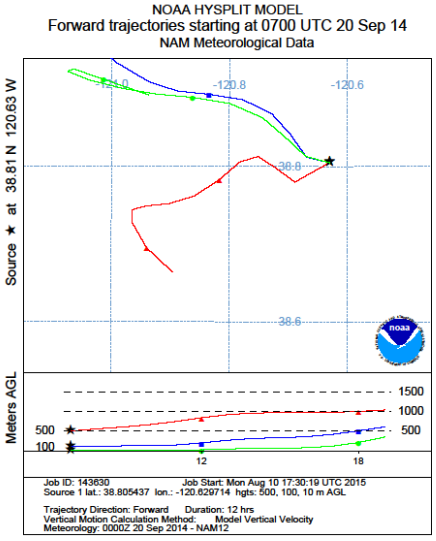


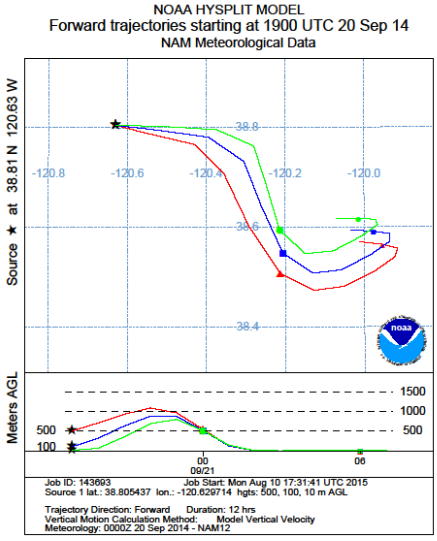
NOAA HYSPLIT MODEL
Forward trajectories starting at 1900 UTC 18 Sep 14
NAM Meteorological Data



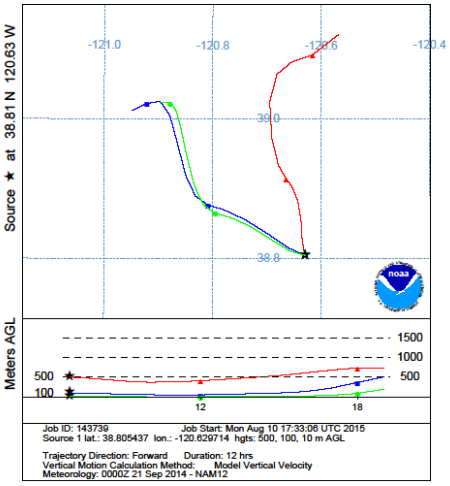

NOAA HYSPLIT MODEL
Forward trajectories starting at 0700 UTC 19 Sep 14
NAM Meteorological Data
Source ★ at 38.81 N 120.63 W
39.0
38.5
38.0
37.5
-121.5
-121.0
-120.5
-120.0
-119.5
Meters AGL
1500
1000
500
500
100
12
18
Job ID: 143551 Job Start: Mon Aug 10 17:28:04 UTC 2015
Source 1 lat.: 38.805437 lon.: -120.629714 hgts: 500, 100, 10 m AGL
Trajectory Direction: Forward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 19 Sep 2014 - NAM12


NOAA HYSPLIT MODEL
Forward trajectories starting at 1900 UTC 19 Sep 14
NAM Meteorological Data
Source ★ at 38.81 N 120.63 W
39.0
38.5
38.0
-121.5
-121.0
-120.5
-120.0
-119.5
Meters AGL
1500
1000
500
500
100
00
09/20
06
Job ID: 143595 Job Start: Mon Aug 10 17:29:07 UTC 2015
Source 1 lat.: 38.805437 lon.: -120.629714 hgts: 500, 100, 10 m AGL
Trajectory Direction: Forward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 19 Sep 2014 - NAM12

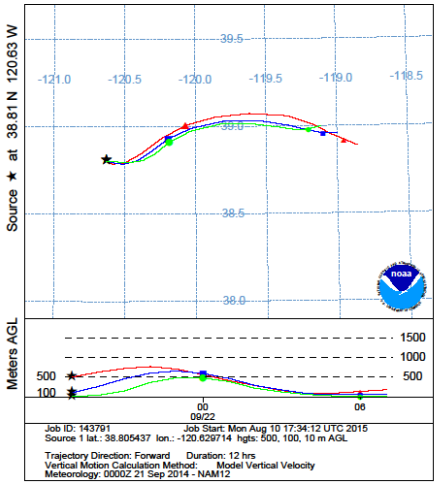

NOAA HYSPLIT MODEL
Forward trajectories starting at 0700 UTC 20 Sep 14
NAM Meteorological Data
Source ★ at 38.81 N 120.63 W
-120.8
-120.6
38.8
38.6
Meters AGL
1500
1000
500
500
100
12
18
Job ID: 143630 Job Start: Mon Aug 10 17:30:19 UTC 2015
Source 1 lat.: 38.805437 lon.: -120.629714 hgts: 500, 100, 10 m AGL
Trajectory Direction: Forward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 20 Sep 2014 - NAM12


NOAA HYSPLIT MODEL
Forward trajectories starting at 1900 UTC 20 Sep 14
NAM Meteorological Data
Source ★ at 38.81 N 120.63 W
38.8
38.6
38.4
-120.8
-120.6
-120.4
-120.2
-120.0
Meters AGL
1500
1000
500
500
100
00
09/21
06
Job ID: 143693 Job Start: Mon Aug 10 17:31:41 UTC 2015
Source 1 lat.: 38.805437 lon.: -120.629714 hgts: 500, 100, 10 m AGL
Trajectory Direction: Forward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 20 Sep 2014 - NAM12

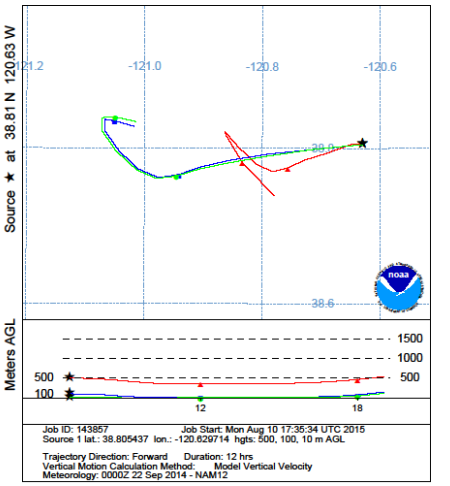
NOAA HYSPLIT MODEL
Forward trajectories starting at 0700 UTC 21 Sep 14
NAM Meteorological Data



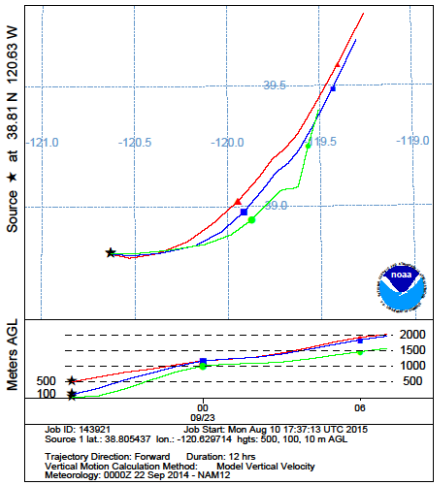
NOAA HYSPLIT MODEL
Forward trajectories starting at 1900 UTC 21 Sep 14
NAM Meteorological Data

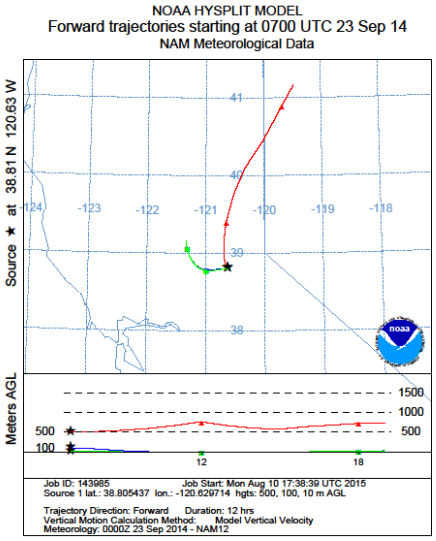


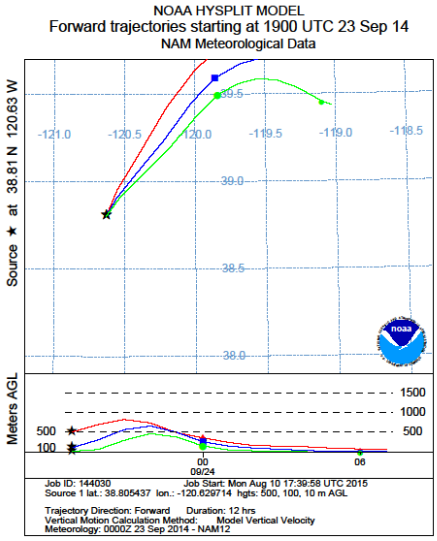
NOAA HYSPLIT MODEL
Forward trajectories starting at 0700 UTC 22 Sep 14
NAM Meteorological Data



NOAA HYSPLIT MODEL
Forward trajectories starting at 1900 UTC 22 Sep 14
NAM Meteorological Data




NOAA HYSPLIT MODEL
Forward trajectories starting at 0700 UTC 23 Sep 14
NAM Meteorological Data
Source ★ at 38.81 N 120.63 W
Meters AGL
Job ID: 143985 Job Start: Mon Aug 10 17:38:39 UTC 2015
Source 1 lat.: 38.805437 lon.: -120.629714 hgts: 500, 100, 10 m AGL
Trajectory Direction: Forward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 23 Sep 2014 - NAM12


NOAA HYSPLIT MODEL
Forward trajectories starting at 1900 UTC 23 Sep 14
NAM Meteorological Data
Source ★ at 38.81 N 120.63 W
Meters AGL
Job ID: 144030 Job Start: Mon Aug 10 17:39:58 UTC 2015
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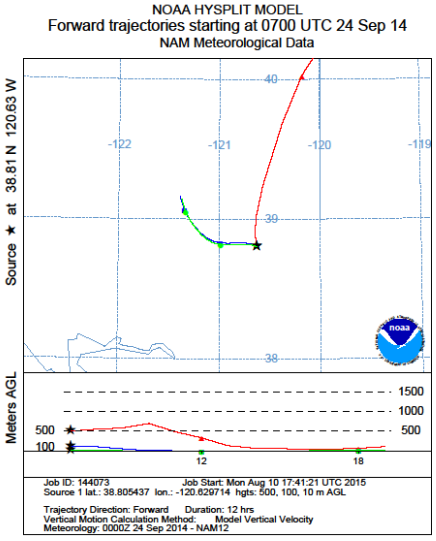
Trajectory Direction: Forward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 23 Sep 2014 - NAM12


NOAA HYSPLIT MODEL
Forward trajectories starting at 0700 UTC 24 Sep 14
NAM Meteorological Data
Source ★ at 38.81 N 120.63 W
Meters AGL
Job ID: 144073 Job Start: Mon Aug 10 17:41:21 UTC 2015
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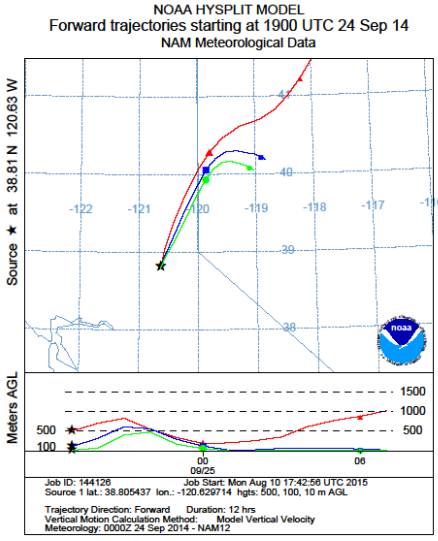
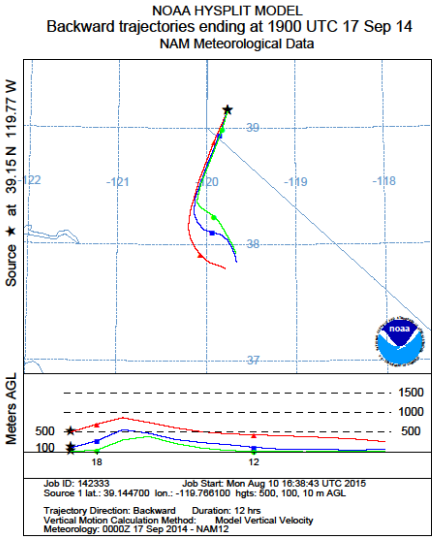
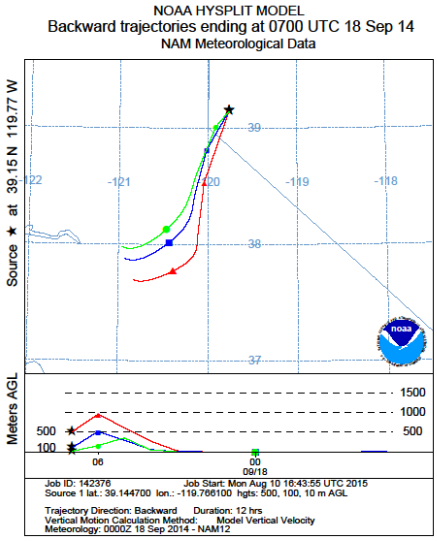
Trajectory Direction: Forward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 24 Sep 2014 - NAM12


NOAA HYSPLIT MODEL
Forward trajectories starting at 1900 UTC 24 Sep 14
NAM Meteorological Data
Source ★ at 38.81 N 120.63 W
Meters AGL
Job ID: 144126 Job Start: Mon Aug 10 17:42:56 UTC 2015
Source 1 lat.: 38.805437 lon.: -120.629714 hgts: 500, 100, 10 m AGL
Trajectory Direction: Forward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 24 Sep 2014 - NAM12

APPENDIX D

HYSPLIT Model Outputs – Backward Trajectories


NOAA HYSPLIT MODEL
Backward trajectories ending at 1900 UTC 17 Sep 14
NAM Meteorological Data
Source ★ at 39.15 N 119.77 W
Meters AGL
Job ID: 142333 Job Start: Mon Aug 10 16:38:43 UTC 2015
Source 1 lat.: 39.144700 lon.: -119.766100 hgts: 500, 100, 10 m AGL
Trajectory Direction: Backward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 17 Sep 2014 - NAM12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Backward trajectories ending at 0700 UTC 18 Sep 14
NAM Meteorological Data
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Meters AGL
Job ID: 142376 Job Start: Mon Aug 10 16:43:55 UTC 2015
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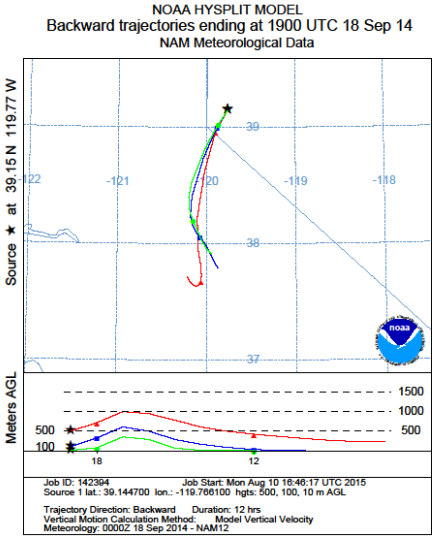
Trajectory Direction: Backward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 18 Sep 2014 - NAM12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Backward trajectories ending at 1900 UTC 18 Sep 14
NAM Meteorological Data
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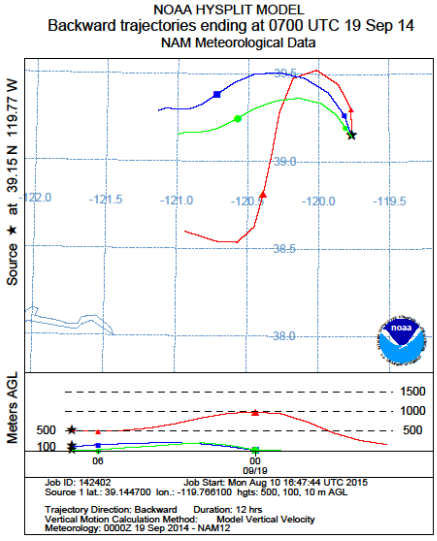
Meters AGL
Job ID: 142394 Job Start: Mon Aug 10 16:46:17 UTC 2015
Source 1 lat.: 39.144700 lon.: -119.766100 hgts: 500, 100, 10 m AGL
Trajectory Direction: Backward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 18 Sep 2014 - NAM12


NOAA HYSPLIT MODEL
Backward trajectories ending at 0700 UTC 19 Sep 14
NAM Meteorological Data
Source ★ at 39.15 N 119.77 W
Meters AGL
Job ID: 142402 Job Start: Mon Aug 10 16:47:44 UTC 2015
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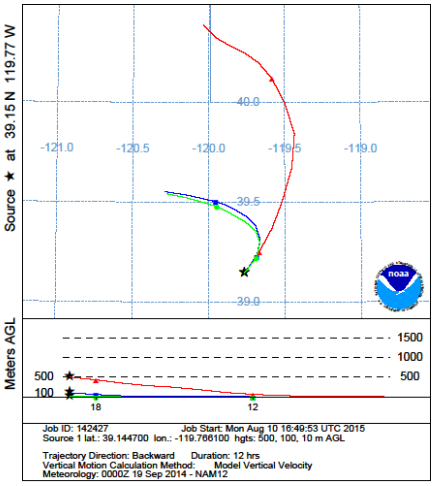
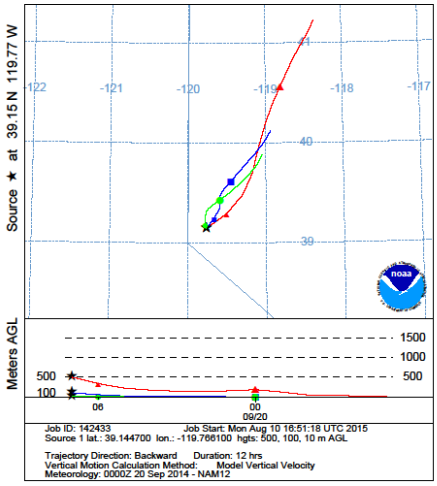
Trajectory Direction: Backward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 19 Sep 2014 - NAM12

NOAA HYSPLIT MODEL
Backward trajectories ending at 1900 UTC 19 Sep 14
NAM Meteorological Data



NOAA HYSPLIT MODEL
Backward trajectories ending at 0700 UTC 20 Sep 14
NAM Meteorological Data



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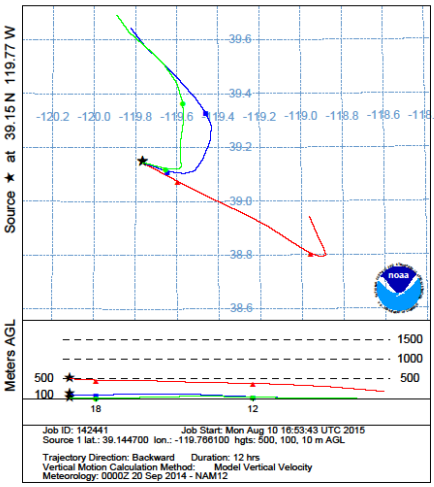
Backward trajectories ending at 1900 UTC 20 Sep 14
NAM Meteorological Data



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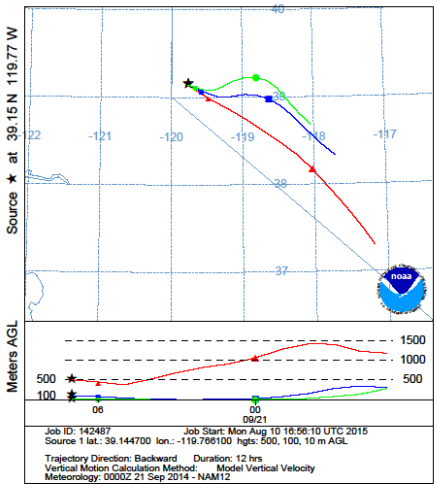

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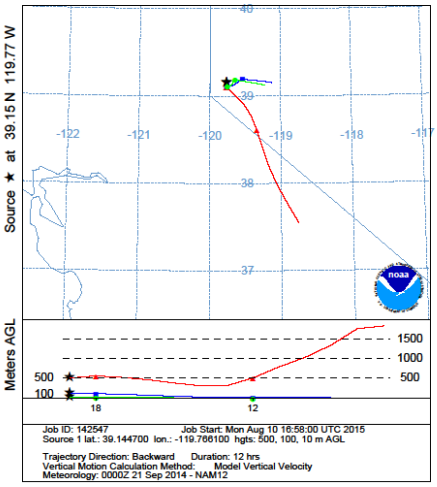
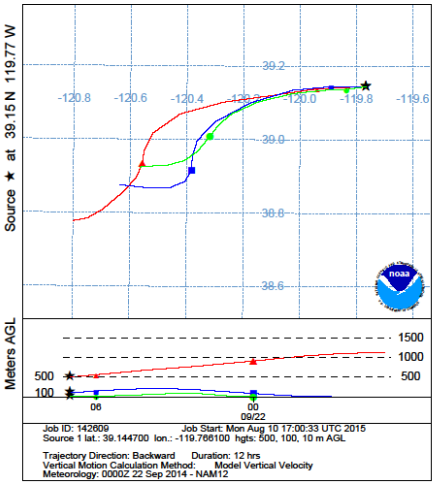
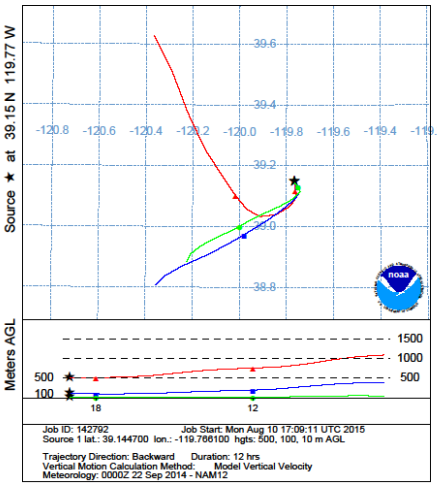


NOAA HYSPLIT MODEL
Backward trajectories ending at 0700 UTC 22 Sep 14
NAM Meteorological Data



NOAA HYSPLIT MODEL
Backward trajectories ending at 1900 UTC 22 Sep 14
NAM Meteorological Data



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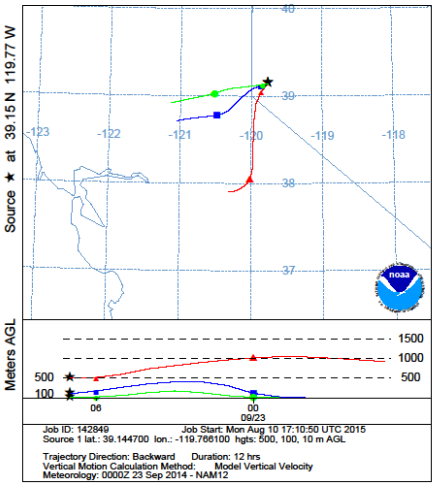
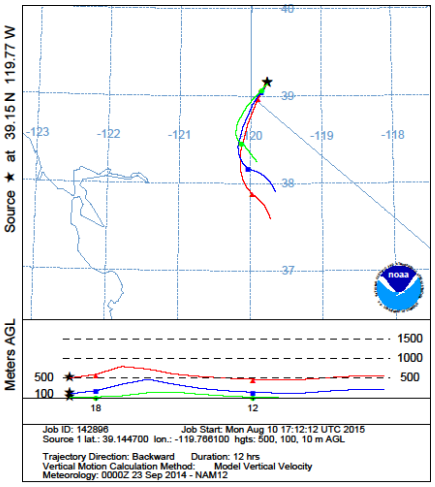
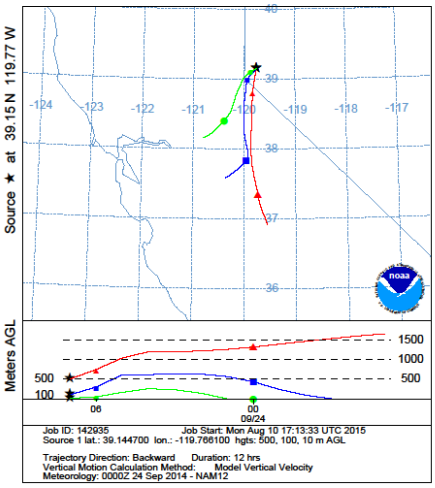
Backward trajectories ending at 0700 UTC 23 Sep 14
NAM Meteorological Data



NOAA HYSPLIT MODEL
Backward trajectories ending at 1900 UTC 23 Sep 14
NAM Meteorological Data



NOAA HYSPLIT MODEL
Backward trajectories ending at 0700 UTC 24 Sep 14
NAM Meteorological Data



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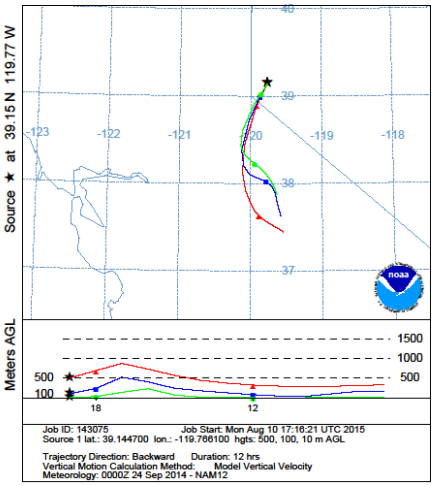
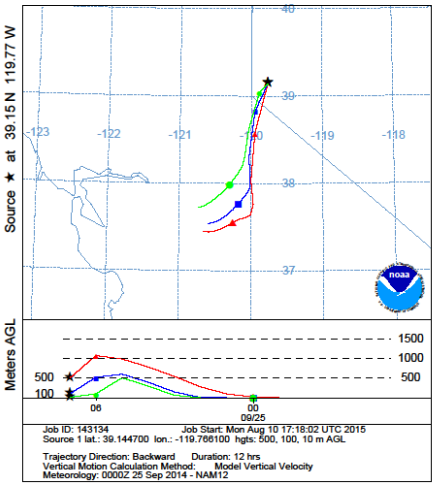
Backward trajectories ending at 1900 UTC 24 Sep 14
NAM Meteorological Data



NOAA HYSPLIT MODEL
Backward trajectories ending at 0700 UTC 25 Sep 14
NAM Meteorological Data



APPENDIX E
Sample Public Notifications

National Oceanic and Atmospheric Administration Satellite Smoke Text Products

Wednesday, September 17, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 0230Z September 18, 2014

```
SMOKE:
Western U.S:
The King wildfire in California, located west-southwest of Lake Tahoe,
is emitting immense amounts of heavy density smoke, currently lifting
northward across northwestern Nevada, eastern Oregon, and western
Idaho. Another wildfire located in southeastern Oregon south of Steens
Mountain is also emitting moderately dense smoke, lifting northward and
combining with the large smoke plume from the King wildfire.

Southern Canada/Central U.S:
Remnant light density smoke is visible drifting eastward across British
Columbia, Alberta, Saskatchewan, extending southeastward over Montana,
the Dakotas, eastern Wyoming, eastern Colorado, Nebraska, Kansas, northern
Oklahoma, western Iowa, and western Missouri. This smoke is most likely
a combination of smoke from multiple wildfires throughout California,
Oregon, and British Columbia.

Heeps

THIS TEXT PRODUCT IS PRIMARILY INTENDED TO DESCRIBE SIGNIFICANT AREAS
OF SMOKE ASSOCIATED WITH ACTIVE FIRES AND SMOKE WHICH HAS BECOME
DETACHED FROM THE FIRES AND DRIFTED SOME DISTANCE AWAY FROM THE SOURCE
FIRE..TYPICALLY OVER THE COURSE OF ONE OR MORE DAYS. AREAS OF BLOWING DUST
ARE ALSO DESCRIBED. USERS ARE ENCOURAGED TO VIEW A GRAPHIC DEPICTION OF
THESE AND OTHER PLUMES WHICH ARE LESS EXTENSIVE AND STILL ATTACHED TO
THE SOURCE FIRE IN VARIOUS GRAPHIC FORMATS ON OUR WEB SITE:

JPEG:   http://www.ospo.noaa.gov/Products/land/hms.html
GIS:    http://www.firedetect.noaa.gov/viewer.htm
KML:    http://www.ssd.noaa.gov/PS/FIRE/kml.html
ANY QUESTIONS OR COMMENTS REGARDING THIS PRODUCT SHOULD BE SENT TO
SSDFireTeam@noaa.gov
```

Unless otherwise indicated:

- Areas of smoke are analyzed using GOES-EAST and GOES-WEST Visible satellite imagery.
- Only a general description of areas of smoke or significant smoke plumes will be analyzed.
- A quantitative assessment of the density/amount of particulate or the vertical distribution is not included.
- Widespread cloudiness may prevent the detection of smoke even from significant fires.

Thursday, September 18, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 1611Z September 18, 2014

```
Western U.S:
Remnant area of light smoke was seen extending from southern Saskatchewan
to the front range of Colorado.  Another area of smoke could be seen
through scattered cloud cover across southern Idaho, northwestern Utah,
northern Nevada and northeastern California.  Both are believed to be
associated with the King wildfire, located east of Sacramento, CA and
continues to produce abundant amounts of smoke.



Warren

THIS TEXT PRODUCT IS PRIMARILY INTENDED TO DESCRIBE SIGNIFICANT AREAS
OF SMOKE ASSOCIATED WITH ACTIVE FIRES AND SMOKE WHICH HAS BECOME
DETACHED FROM THE FIRES AND DRIFTED SOME DISTANCE AWAY FROM THE SOURCE
FIRE..TYPICALLY OVER THE COURSE OF ONE OR MORE DAYS. AREAS OF BLOWING DUST
ARE ALSO DESCRIBED. USERS ARE ENCOURAGED TO VIEW A GRAPHIC DEPICTION OF
THESE AND OTHER PLUMES WHICH ARE LESS EXTENSIVE AND STILL ATTACHED TO
THE SOURCE FIRE IN VARIOUS GRAPHIC FORMATS ON OUR WEB SITE:

JPEG:   http://www.ospo.noaa.gov/Products/land/hms.html
GIS:    http://www.firedetect.noaa.gov/viewer.htm
KML:    http://www.ssd.noaa.gov/PS/FIRE/kml.html
ANY QUESTIONS OR COMMENTS REGARDING THIS PRODUCT SHOULD BE SENT TO
SSDFireTeam@noaa.gov
```

Unless otherwise indicated:

- Areas of smoke are analyzed using GOES-EAST and GOES-WEST Visible satellite imagery.
- Only a general description of areas of smoke or significant smoke plumes will be analyzed.
- A quantitative assessment of the density/amount of particulate or the vertical distribution is not included.
- Widespread cloudiness may prevent the detection of smoke even from significant fires.

Thursday, September 18, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 0230Z September 19, 2014

SMOKE
Western U.S:
An extensive area of heavy density smoke oriented southwest-northeast is visible across northern California, northern Nevada, Idaho, and western Montana. This plume is associated with the King wildfire, located east of Sacramento, CA which continues to emit heavy density smoke at this time.

Central U.S:
Light density remnant smoke is seen moving eastward over Minnesota, Iowa, South Dakota, Nebraska, Kansas, and far southeastern Colorado. This smoke is most likely associated with the King wildfire occurring in CA.

DUST:
Southern California:
Blowing dust is visible moving eastward across and just north of the Salton Sea, currently reaching the CA/AZ border. This dust is originating from the Anza-Borrego Desert and areas just northwest of the Salton Sea in the Coachella Valley.

Heeps

THIS TEXT PRODUCT IS PRIMARILY INTENDED TO DESCRIBE SIGNIFICANT AREAS OF SMOKE ASSOCIATED WITH ACTIVE FIRES AND SMOKE WHICH HAS BECOME DETACHED FROM THE FIRES AND DRIFTED SOME DISTANCE AWAY FROM THE SOURCE FIRE..TYPICALLY OVER THE COURSE OF ONE OR MORE DAYS. AREAS OF BLOWING DUST ARE ALSO DESCRIBED. USERS ARE ENCOURAGED TO VIEW A GRAPHIC DEPICTION OF THESE AND OTHER PLUMES WHICH ARE LESS EXTENSIVE AND STILL ATTACHED TO THE SOURCE FIRE IN VARIOUS GRAPHIC FORMATS ON OUR WEB SITE:

JPEG: http://www.ospo.noaa.gov/Products/land/hms.html
GIS: http://www.firedetect.noaa.gov/viewer.htm
KML: http://www.ssd.noaa.gov/PS/FIRE/kml.html
ANY QUESTIONS OR COMMENTS REGARDING THIS PRODUCT SHOULD BE SENT TO SSDFireTeam@noaa.gov

Unless otherwise indicated:

- Areas of smoke are analyzed using GOES-EAST and GOES-WEST Visible satellite imagery.
- Only a general description of areas of smoke or significant smoke plumes will be analyzed.
- A quantitative assessment of the density/amount of particulate or the vertical distribution is not included.
- Widespread cloudiness may prevent the detection of smoke even from significant fires.

Friday September 19, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 1600Z September 19, 2014

```
SMOKE
Western U.S:
A large area of light to moderate density smoke is visible moving
southwest-northeast this morning extending across northern California,
and northern Nevada. This plume is associated with the King wildfire,
located east of Sacramento, CA which continues to burn.

Northern Plains:
A plume of light-density remnant smoke originating from the King wildfire
is visible moving NE extending from Montana through North Dakota north
into Saskatchewan and Manitoba.

Midwest:
A plume of remnant smoke is visible affecting Iowa, Minnesota, Wisconsin,
Illinois, and Missouri this morning. This smoke originates from the
plumes seen last night in satellite imagery moving eastward from the
Northern Plains/Midwest.

Oegerle



THIS TEXT PRODUCT IS PRIMARILY INTENDED TO DESCRIBE SIGNIFICANT AREAS
OF SMOKE ASSOCIATED WITH ACTIVE FIRES AND SMOKE WHICH HAS BECOME
DETACHED FROM THE FIRES AND DRIFTED SOME DISTANCE AWAY FROM THE SOURCE
FIRE..TYPICALLY OVER THE COURSE OF ONE OR MORE DAYS. AREAS OF BLOWING DUST
ARE ALSO DESCRIBED. USERS ARE ENCOURAGED TO VIEW A GRAPHIC DEPICTION OF
THESE AND OTHER PLUMES WHICH ARE LESS EXTENSIVE AND STILL ATTACHED TO
THE SOURCE FIRE IN VARIOUS GRAPHIC FORMATS ON OUR WEB SITE:

JPEG:   http://www.ospo.noaa.gov/Products/land/hms.html
GIS:    http://www.firedetect.noaa.gov/viewer.htm
KML:    http://www.ssd.noaa.gov/PS/FIRE/kml.html
ANY QUESTIONS OR COMMENTS REGARDING THIS PRODUCT SHOULD BE SENT TO
SSDFireTeam@noaa.gov
```

Unless otherwise indicated:

- Areas of smoke are analyzed using GOES-EAST and GOES-WEST Visible satellite imagery.
- Only a general description of areas of smoke or significant smoke plumes will be analyzed.
- A quantitative assessment of the density/amount of particulate or the vertical distribution is not included.
- Widespread cloudiness may prevent the detection of smoke even from significant fires.

Friday, September 19, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 0230Z September 20, 2014

```
SMOKE
Western U.S:
An extensive area of moderate to heavy density smoke is visible over
much of western U.S, originating from the King wildfire located east
of Sacramento, CA. The lighter smoke is focused further east over
southwestern Wyoming, southern Idaho, southern Oregon, northern Utah,
and northern Nevada. The thickest smoke is visible moving westward
throughout much of California.

Northern Plains:
Light to moderate density smoke oriented southwest-northeast is seen
moving eastward across Minnesota, the Dakotas, and back over northeastern
Wyoming. This remnant smoke is associated with the King wildfire occurring
in CA.

Central U.S:
An area of light density smoke is seen swirling over southern Iowa,
northern Missouri, Kansas, Oklahoma, and northeastern Texas. This smoke
is likely a combination of remnant smoke from the King wildfire as well
as smoke associated with the multitude of agricultural burns that have
been occurring throughout the Mississippi Valley.

Heeps

THIS TEXT PRODUCT IS PRIMARILY INTENDED TO DESCRIBE SIGNIFICANT AREAS
OF SMOKE ASSOCIATED WITH ACTIVE FIRES AND SMOKE WHICH HAS BECOME
DETACHED FROM THE FIRES AND DRIFTED SOME DISTANCE AWAY FROM THE SOURCE
FIRE..TYPICALLY OVER THE COURSE OF ONE OR MORE DAYS. AREAS OF BLOWING DUST
ARE ALSO DESCRIBED. USERS ARE ENCOURAGED TO VIEW A GRAPHIC DEPICTION OF
THESE AND OTHER PLUMES WHICH ARE LESS EXTENSIVE AND STILL ATTACHED TO
THE SOURCE FIRE IN VARIOUS GRAPHIC FORMATS ON OUR WEB SITE:

JPEG:   http://www.ospo.noaa.gov/Products/land/hms.html
GIS:    http://www.firedetect.noaa.gov/viewer.htm
KML:    http://www.ssd.noaa.gov/PS/FIRE/kml.html
ANY QUESTIONS OR COMMENTS REGARDING THIS PRODUCT SHOULD BE SENT TO
SSDFireTeam@noaa.gov
```

Unless otherwise indicated:

- Areas of smoke are analyzed using GOES-EAST and GOES-WEST Visible satellite imagery.
- Only a general description of areas of smoke or significant smoke plumes will be analyzed.
- A quantitative assessment of the density/amount of particulate or the vertical distribution is not included.
- Widespread cloudiness may prevent the detection of smoke even from significant fires.

Saturday, September 20, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 1700Z September 20, 2014

```
SMOKE:
California:
An area of light-density smoke is visible over much of northwestern
California, originating from the King wildfire located east of Sacramento,
CA. The smoke is moving westward towards the coast and empties into
the Pacific Ocean. Some of the remnant smoke is visible moving north,
towards the weakened Happy Camp complex.

Central U.S:
Areas of light density remnant smoke is visible moving eastward throughout
the plains into the Midwest. Two separate plumes are  visible moving
through western Wyoming, Nebraska, western Colorado, Kansas, northern
Oklahoma, northern Texas, Missouri, northern Arkansas, and southern
Illinois. This smoke is likely a combination of remnant smoke from
the King wildfire as well as smoke associated with the multitude of
agricultural burns that have been occurring throughout the Mississippi
Valley.

Oegerle


THIS TEXT PRODUCT IS PRIMARILY INTENDED TO DESCRIBE SIGNIFICANT AREAS
OF SMOKE ASSOCIATED WITH ACTIVE FIRES AND SMOKE WHICH HAS BECOME
DETACHED FROM THE FIRES AND DRIFTED SOME DISTANCE AWAY FROM THE SOURCE
FIRE..TYPICALLY OVER THE COURSE OF ONE OR MORE DAYS. AREAS OF BLOWING DUST
ARE ALSO DESCRIBED. USERS ARE ENCOURAGED TO VIEW A GRAPHIC DEPICTION OF
THESE AND OTHER PLUMES WHICH ARE LESS EXTENSIVE AND STILL ATTACHED TO
THE SOURCE FIRE IN VARIOUS GRAPHIC FORMATS ON OUR WEB SITE:

JPEG:   http://www.ospo.noaa.gov/Products/land/hms.html
GIS:    http://www.firedetect.noaa.gov/viewer.htm
KML:    http://www.ssd.noaa.gov/PS/FIRE/kml.html
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SSDFireTeam@noaa.gov
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- Widespread cloudiness may prevent the detection of smoke even from significant fires.

Saturday, September 20, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 0230Z September 21, 2014

SMOKE:
Ohio Valley:
An area of light density smoke is visible moving eastward across Illinois, Indiana, Kentucky, Ohio, southeastern Michigan, western West Virginia, western Pennsylvania, and western New York. This smoke is most likely remnant smoke from the King wildfire occurring in CA that has moved across the country.

South-central U.S:
Light density smoke is visible drifting over Louisiana, northeastern Texas, Oklahoma, northwestern Arkansas, Kansas, and Missouri. While northern portions of the plume may be associated with the King wildfire, most of the plume most likely originates from the multitude of agricultural fires that continue to occur throughout the Mississippi Valley.

Western U.S:
A large area of moderate to heavy density smoke is visible moving northwest throughout California and into Oregon, southwestern Idaho, and out over the western coastline over the Pacific Ocean. Much of this smoke is associated with the King wildfire located east of Sacramento, Ca. Some newer wildfires appearing in Oregon (one of them named the '36 Pit' wildfire in northwestern Oregon) have been producing light to moderate density smoke which has been contributing to the larger smoke plume. A number of smaller wildfires have also been seen through central Idaho and northeastern Oregon, essentially remaining close to the wildfires and drifting over the region.

Heeps

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Sunday, September 21, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 1815Z September 21, 2014

SMOKE:
South-central US:
An area of thin smoke extends from the Texas coast northward across portions of Oklahoma, Louisiana, and Arkansas and then northeastward along a frontal boundary crossing southern Missouri, southern Illinois, and southwest Indiana. While some of the smoke further north could have come from the King wildfire in CA, much of the smoke is thought to be from fires in east Texas and along the Lower Mississippi River Valley.

Western U.S:
An area of thin smoke with small pockets of moderately dense smoke was visible over northwest Oregon, Washington, and far southern British Columbia. This smoke is likely associated with the King wildfire located east of Sacramento, CA and also with wildfires appearing in Oregon yesterday. Smaller wildfires in north central Idaho and northeastern Oregon also likely contributed to small areas of thin smoke near those areas.

Sheffler

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Sunday, September 21, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 0230Z September 22, 2014

SMOKE:
South-central U.S:
A small area of light density smoke remains out ahead of a frontal boundary over eastern Texas, northwestern Louisiana, southern Arkansas, and southern Oklahoma. This area was seen earlier today, and most of the smoke is thought to be from fires in east Texas and along the Lower Mississippi River Valley.

Western U.S:
Moderate to heavy density smoke is visible moving northward along the Pacific coastline over California, Oregon, Washington, northern Idaho, and southern British Columbia. Pockets of embedded heavy density smoke are seen through central and northern California close to currently burning wildfire complexes (specifically the â€œJuneâ€ and â€œHappy Camp Complexâ€ wildfires), and another pocket in northern Washington moving into southern British Columbia. This large area of smoke is most likely an amalgamation of smoke from the many fire complexes that are occurring throughout California, Oregon, and Idaho.

Heeps

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Monday, September 22, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 1800Z September 22, 2014

SMOKE:
Central and South Central Plains/Southeast U.S/Western Atlantic:
An area of thin remnant smoke is seen this morning from south central Nebraska extending south/southeast across parts of Kansas, Oklahoma, and Texas. The thin smoke then extends eastward along a frontal boundary that is approaching the Gulf Coast covering portions of Louisiana, Mississippi, Alabama, and Georgia. This smoke is thought to be mostly from agricultural burning in eastern Texas and along the Lower Mississippi River Valley during the last few days. In addition, other unknown aerosol is seen along/over the coasts of the Carolinas/Georgia extending northeastward along the frontal boundary offshore of the Mid-Atlantic/New England regions to Nova Scotia. While there may be some smoke from fires in the south central US or from the King fire in California mixed into this aerosol, it could not be determined if this was the case or if other aerosols make up the majority of its composition.

Western U.S:
Moderately dense to dense smoke is visible near the King Fire in central California extending northward over the Sacramento Valley. Other areas of thin smoke from this and other California wildfires were pulled northeast across north Nevada and southern Oregon by a strong storm system yesterday and this morning.

Western Canada:
An area of mostly thin remnant smoke stretches northward from far northeast Washington/southeast British Columbia to near Great Slave Lake in the Northwest Territories and then southeast across northern Saskatchewan. Some embedded moderate density smoke was present just south of Great Slave Lake and another pocket of thin smoke is present near a cluster of wildfires burning in northeast British Columbia. Fires in the western/northwestern US and in British Columbia are responsible for the remnant smoke.

Sheffler

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Monday, September 22, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 0000Z September 23, 2014

Currently:
Southeast US/Atlantic Coast:
Smoke seen earlier today in the Central and Southern Plains and stretching along a frontal boundary through the Mississippi Valley can now been seen through central/eastern South Carolina eastward into the Atlantic Ocean. Once again the smoke is along the frontal boundary continuing to move east. Also, unknown aerosol continues to be seen along the Atlantic coast stretching from North Carolina to the New England region.

California:
The King Fire west of Lake Tahoe continues to produce moderately dense to dense smoke moving northeastward and pushing into the northeast region of California and into western Nevada. Residual smoke can still be seen north through the Sacramento Valley and west of the wildfire.

Mississippi Valley:
Numerous fires across the region in the states of Mississippi, Arkansas, northeast Louisiana, southeast Missouri continue to produce mostly light smoke moving s-ward across the region.

J Kibler

Earlier Today

SMOKE:
Central and South Central Plains/Southeast U.S/Western Atlantic:
An area of thin remnant smoke is seen this morning from south central Nebraska extending south/southeast across parts of Kansas, Oklahoma, and Texas. The thin smoke then extends eastward along a frontal boundary that is approaching the Gulf Coast covering portions of Louisiana, Mississippi, Alabama, and Georgia. This smoke is thought to be mostly from agricultural burning in eastern Texas and along the Lower Mississippi River Valley during the last few days. In addition, other unknown aerosol is seen along/over the coasts of the Carolinas/Georgia extending northeastward along the frontal boundary offshore of the Mid-Atlantic/New England regions to Nova Scotia. While there may be some smoke from fires in the south central US or from the King fire in California mixed into this aerosol, it could not be determined if this was the case or if other aerosols make up the majority of its composition.

Western U.S:
Moderately dense to dense smoke is visible near the King Fire in central California extending northward over the Sacramento Valley. Other areas of thin smoke from this and other California wildfires were pulled northeast across north Nevada and southern Oregon by a strong storm system yesterday and this morning.

Western Canada:
An area of mostly thin remnant smoke stretches northward from far

northeast Washington/southeast British Columbia to near Great Slave Lake in the Northwest Territories and then southeast across northern Saskatchewan. Some embedded moderate density smoke was present just south of Great Slave Lake and another pocket of thin smoke is present near a cluster of wildfires burning in northeast British Columbia. Fires in the western/northwestern US and in British Columbia are responsible for the remnant smoke.

Sheffler

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Tuesday, September 23, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 1615Z September 23, 2014

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Western Canada:
An area of mostly thin remnant smoke from fires burning in northeastern
British Columbia and the Northwest Territories was located in southeastern
Northwest Territories.

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Tuesday, September 23, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 0400Z September 24, 2014

Western US to South Central Canada:
Areas of thin remnant smoke had been pulled northeastward across the northern Rockies and over southern parts of Alberta and Saskatchewan. The smoke was not as easy to recognize over western Montana and Idaho due to extensive cloud cover. This smoke is from several fires burning in the western US...most notably the King Fire in central California. Moderately dense to dense smoke associated with this fire was seen just west and north of Lake Tahoe and extending northeast across northwestern Nevada. A plume of remnant thin to moderately dense smoke likely from the King wildfire was also oriented from north central California southward across San Francisco Bay and over the Pacific.

Central and Northwest Canada:
An area of thin remnant smoke is seen stretching from central Saskatchewan/northwest Manitoba northward over southern Nunavut. This smoke is likely from recent fires in British Columbia and possibly also from renewed fire activity just west of Great Slave Lake where locally dense smoke was being emitted tonight. Some smoke from the western US wildfires may also have been entrained into the southern end of the smoke plume.

Texas and Oklahoma Panhandles/Western Kansas:
An aerosol that is thought to be blowing dust is seen over parts of the Texas and Oklahoma Panhandles/Southwest Kansas this evening as strong winds picked up along a frontal boundary. The possible dust was observed from about 22Z until sunset at 0045Z.

Western Gulf/South and Southwest Texas/Northeast Mexico:
An unknown aerosol is seen along an old frontal boundary that is draped over the Gulf of Mexico. The aerosol extends west across far southern Texas and then northeastward along the Rio Grande/US-Mexico border. There was an area of smoke observed along this boundary Monday morning/evening caused by fires in the south central US Sunday/Monday...however it is likely that other aerosols are now mixed in.

Sheffler

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Wednesday, September 24, 2014

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 1730Z September 24, 2014

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California:
The King wildfire west of Lake Tahoe is producing an area of light smoke
with some moderate smoke near source.   Smoke is moving north across
the Sacramento Valley, but has not reach neighboring states at this time.

Idaho/Montana:
An area of very light residual smoke can be across parts of
northern/central Idaho and east into western Montana.   The source of
the smoke cannot be confirmed, but most likely residual smoke from the
King wildfire burning in California.

J Kibler

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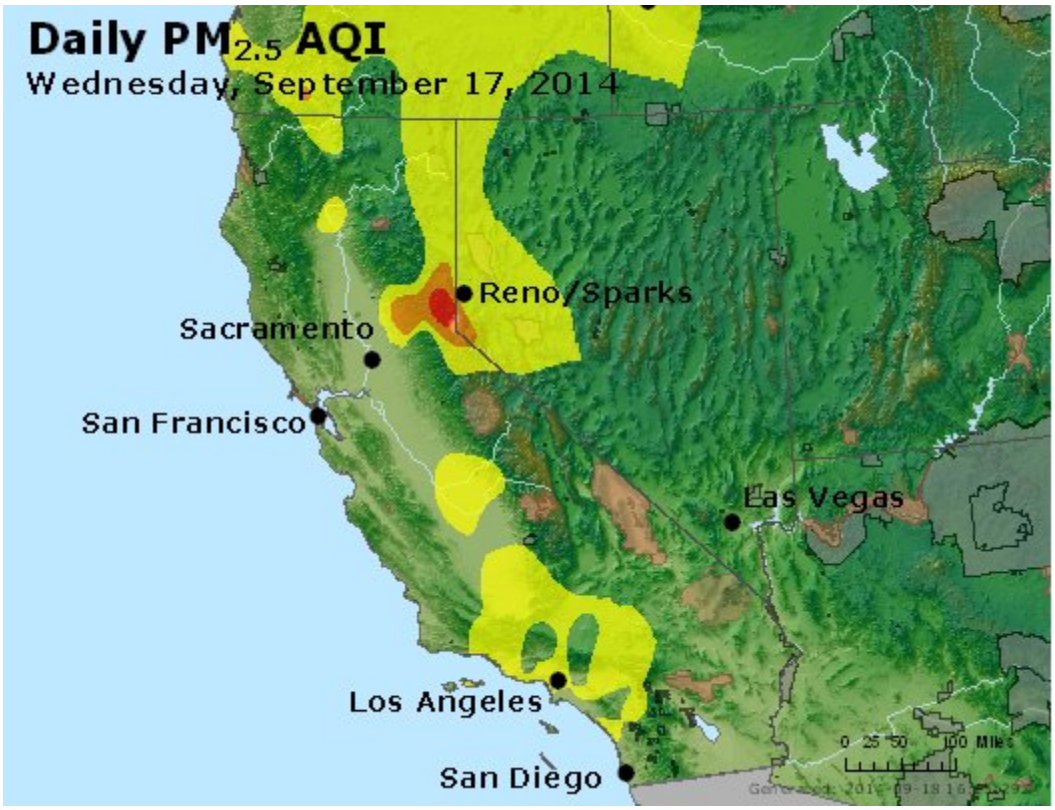
AirNow Air Quality Maps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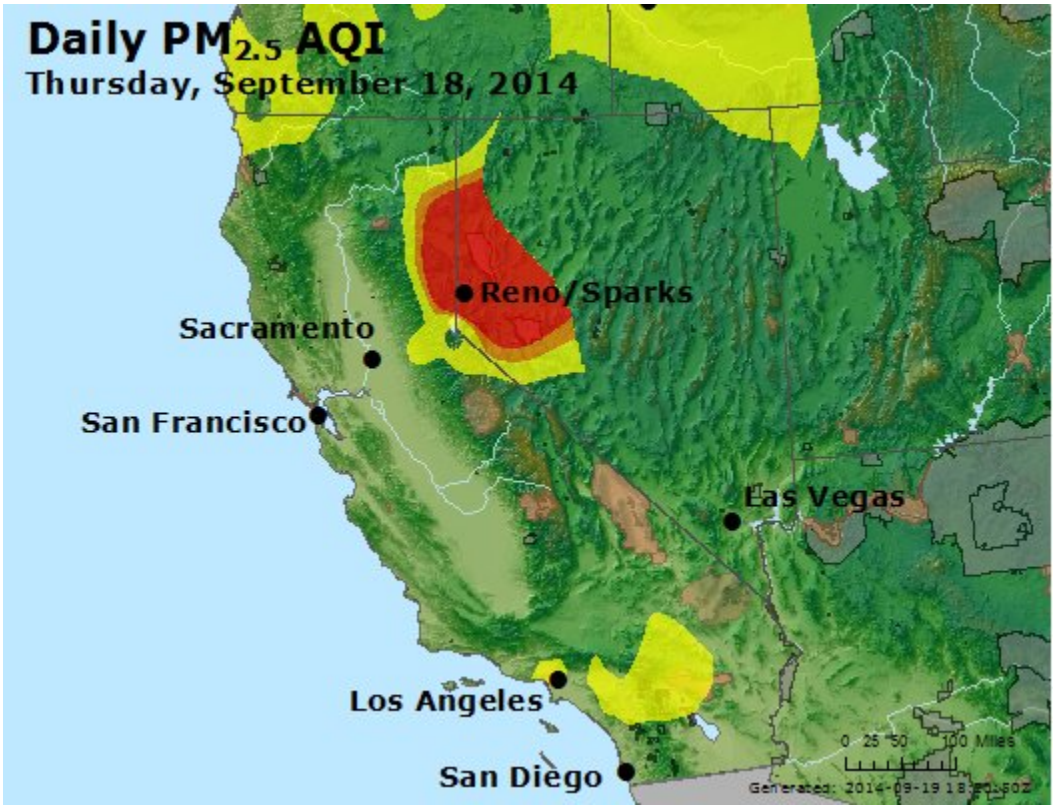
Wednesday, September 17, 2014
Reno/Sparks
Sacramento
San Francisco
Las Vegas
Los Angeles
San Diego
0 25 50 100 Miles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Thursday, September 18, 2014
Reno/Sparks
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San Francisco
Las Vegas
Los Angeles
San Diego
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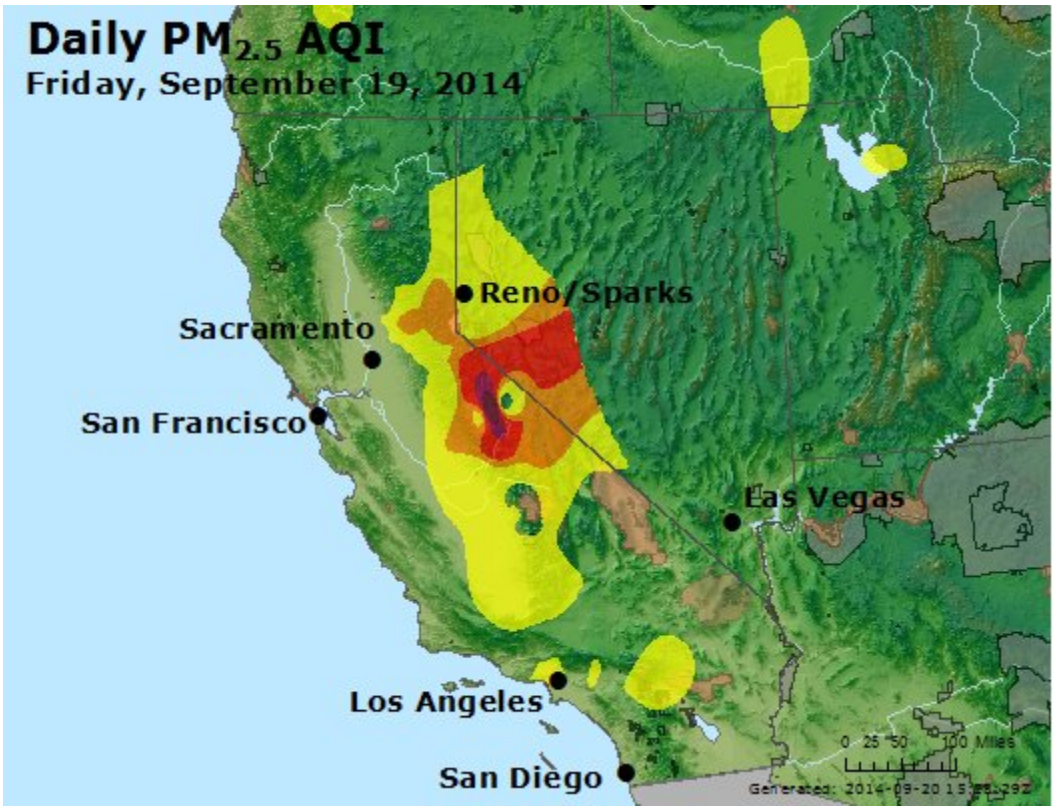
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Friday, September 19, 2014
Reno/Sparks
Sacramento
San Francisco
Las Vegas
Los Angeles
San Diego
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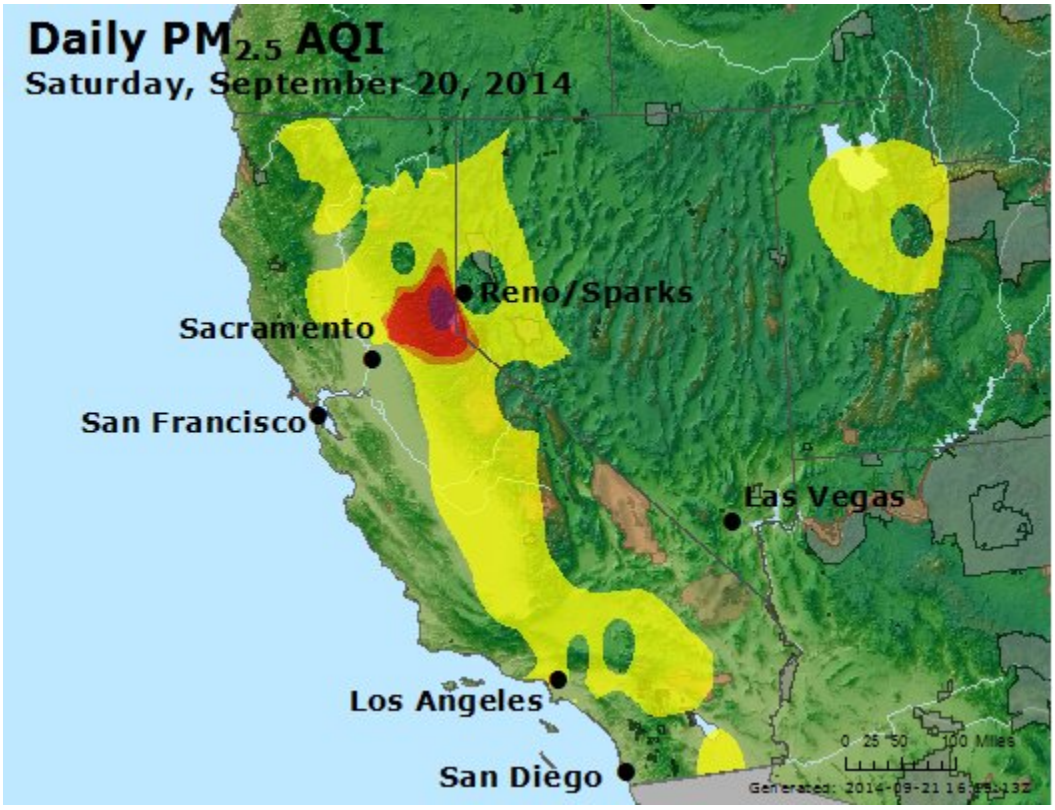
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Saturday, September 20, 2014
Reno/Sparks
Sacramento
San Francisco
Las Vegas
Los Angeles
San Diego
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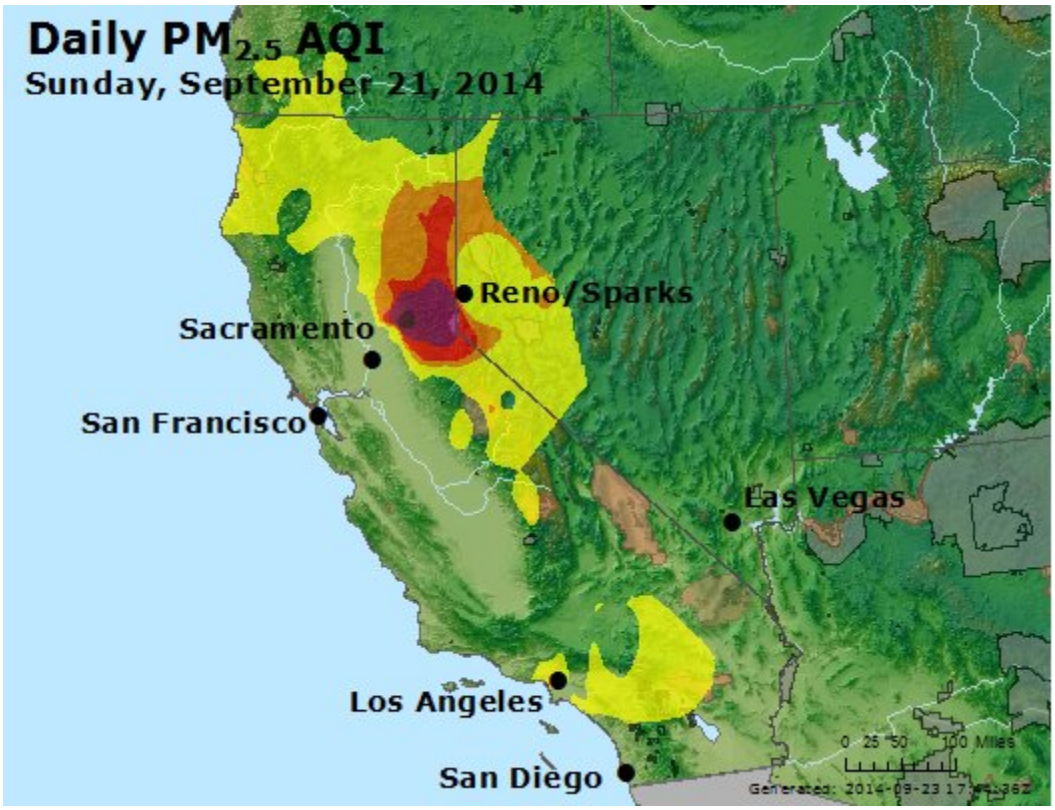
Daily PM2.5 AQI
Sunday, September 21, 2014
Reno/Sparks
Sacramento
San Francisco
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San Diego
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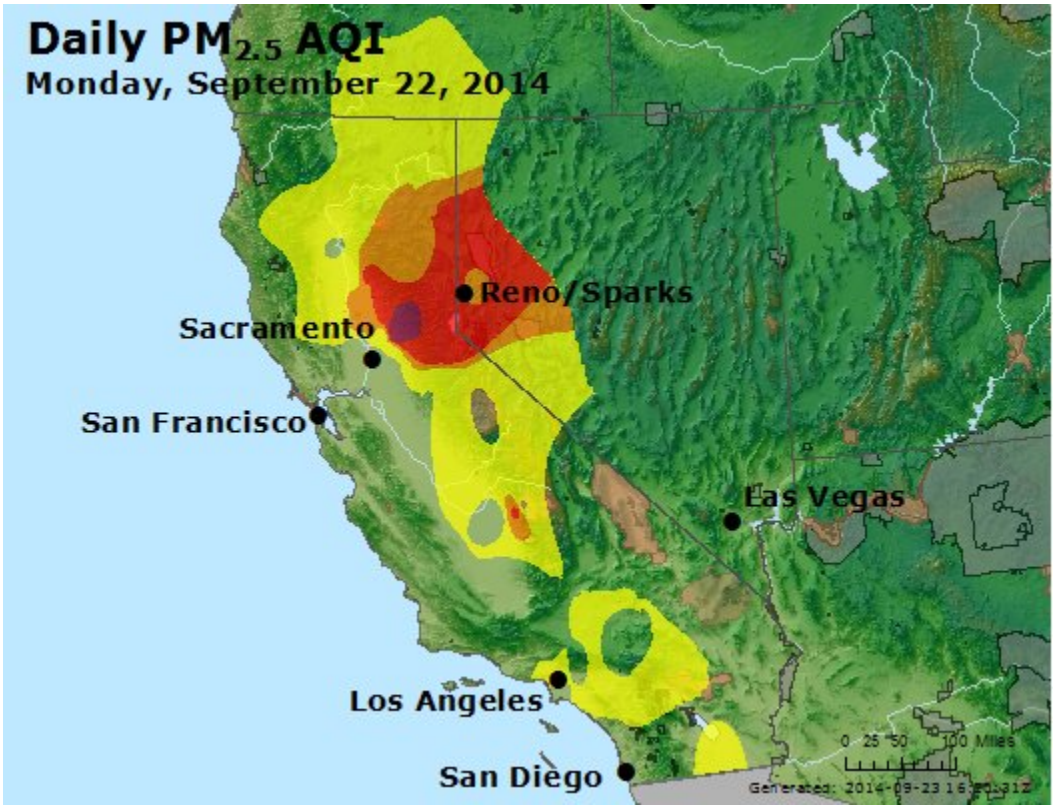
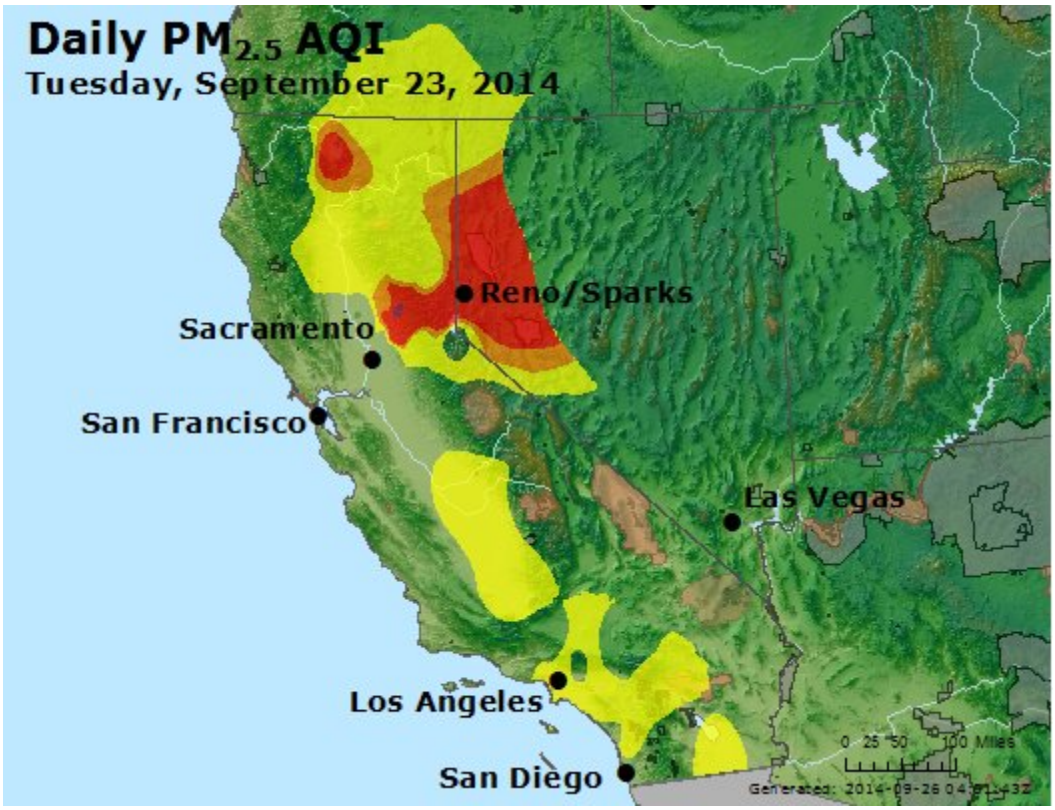

Daily PM2.5 AQI
Monday, September 22, 2014
Reno/Sparks
Sacramento
San Francisco
Las Vegas
Los Angeles
San Diego
0 25 50 100 Miles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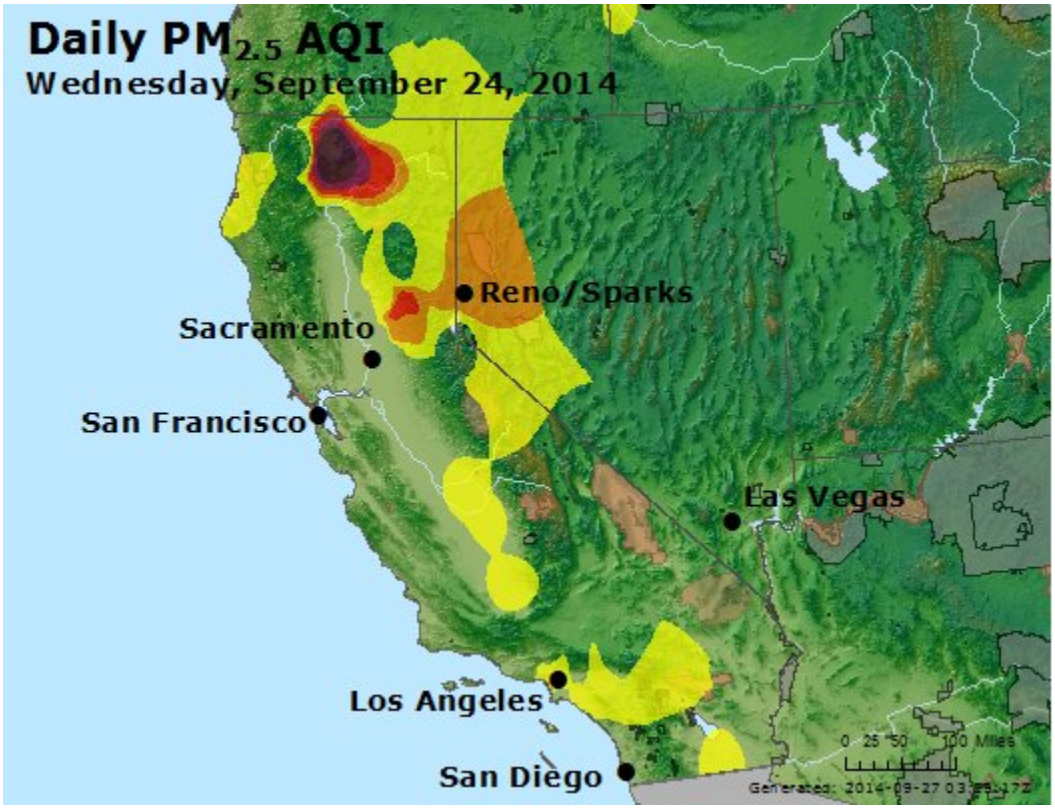
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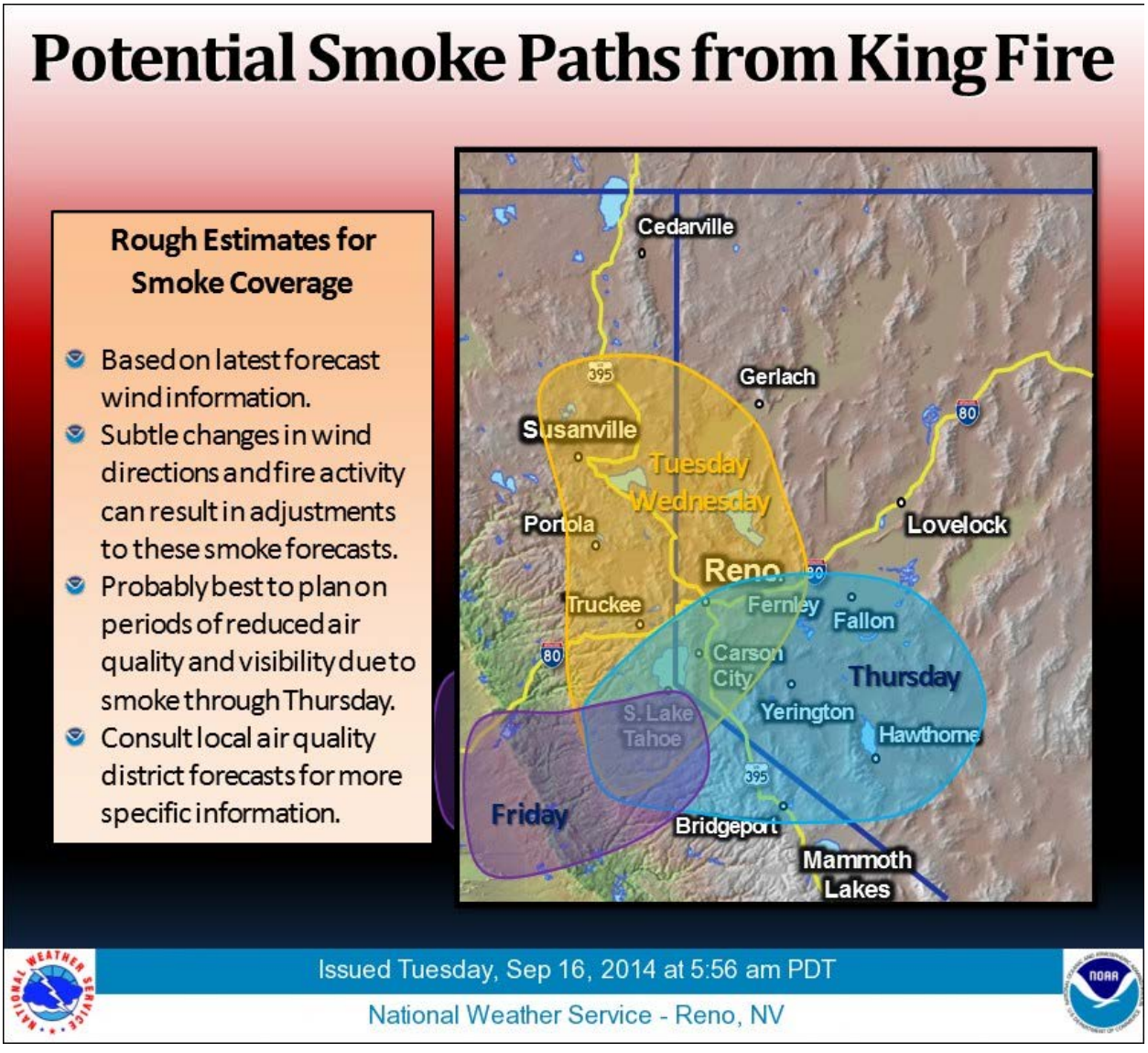
National Weather Service Products



AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
319 AM PDT WED SEP 17 2014

.SYNOPSIS...

SMOKE AND HAZE FROM THE KING FIRE WILL CONTINUE TO IMPACT THE AREA THROUGH AT LEAST THURSDAY MORNING. LOW PRESSURE OFF THE WEST COAST WILL BRING WARM AND BREEZY CONDITIONS TODAY FOLLOWED BY COOLER TEMPERATURES WITH A CHANCE OF THUNDERSTORMS THURSDAY. THIS LOW WILL THEN MOVE SLOWLY ACROSS SOUTHERN CALIFORNIA THIS WEEKEND, KEEPING A POSSIBILITY OF THUNDERSTORMS MAINLY SOUTH OF HIGHWAY 50.

&&

.SHORT TERM...

VISIBILITY DUE TO SMOKE FROM THE KING FIRE HAS IMPROVED OVER MOST AREAS EXCEPT AROUND LOVELOCK AND FALLON WHERE LATEST OBS HAVE REPORTED VISIBILITY AT 3-4 MILES. THIS SMOKE SHOULD DISPERSE INTO A HAZE LAYER THIS MORNING, BUT ASSUMING ANOTHER FLARE-UP OF THE FIRE THIS AFTERNOON, STRONGER SW WINDS WILL SPREAD ANOTHER ROUND OF SMOKE ACROSS MUCH OF THE REGION, ESPECIALLY FROM HIGHWAY 50 NORTHWARD INCLUDING THE RENO-TAHOE VICINITY. GUSTS OF 35-40 MPH ARE EXPECTED THIS AFTERNOON THROUGH EARLY EVENING ACROSS LOWER ELEVATIONS, WITH SIERRA RIDGE GUSTS NEAR 60 MPH. LAKE WIND ADVISORIES WILL REMAIN IN PLACE FOR BOTH TAHOE AND PYRAMID LAKES THROUGH EARLY EVENING.

SOME LOCAL FIRE WEATHER CONCERNS WILL BE POSSIBLE THIS AFTERNOON DUE TO THE GUSTY WINDS AND DRY FUELS, BUT AS THE WINDS INCREASE LATER TODAY THEY WILL BE ACCOMPANIED BY A DROP IN TEMPERATURE AND INCREASE IN HUMIDITY TO ABOVE 15% IN MOST AREAS. WE WILL KEEP A

HEADLINE GOING FOR NOW IN THE FIRE WEATHER FORECAST, BUT NO WARNINGS ARE PLANNED.

AIR MASS WILL REMAIN TOO STABLE FOR CONVECTION OVER MOST OF THE REGION EXCEPT FOR WEST CENTRAL NV MAINLY EAST OF HIGHWAY 95, WHERE CONVERGENCE ZONE OVER CENTRAL NV AND WARMER TEMPS MAY BE SUFFICIENT TO OVERCOME MID LEVEL CAP BY LATE AFTERNOON. A WEAK JET STREAK MOVING ACROSS NORTHWEST NV TONIGHT MAY PROVIDE ENOUGH LIFT TO PRODUCE A FEW SHOWERS IN EASTERN PERSHING AND CHURCHILL COUNTIES OVERNIGHT. OTHERWISE, UPPER LEVEL FORCING WILL INCREASE OVER NORTHEAST CA-NORTHWEST NV BY THURSDAY MORNING.

FOR THE REMAINDER OF THURSDAY, THE CLOSER PROXIMITY OF THE UPPER LOW CENTER ALONG WITH UPPER LEVEL SHORTWAVE AND JET STREAK CROSSING WESTERN NV WILL BRING A CHANCE FOR SHOWERS AND THUNDERSTORMS. CURRENTLY, THE BETTER POTENTIAL WILL BE OVER NORTHEAST CA-NORTHWEST NV BUT ISOLATED CONVECTION WILL BE POSSIBLE OVER ANY PORTION OF THE REGION. HOWEVER, POTENTIAL FOR SIGNIFICANT RAINFALL IS SLIM AS DEEPER MOISTURE IS NOT EXPECTED TO BE PRESENT ON THURSDAY. HIGHS ON THURSDAY WILL BE NOTABLY COOLER WITH MOST VALLEYS IN THE LOWER-MID 80S EXCEPT REMAINING IN THE 70S FOR NORTHEAST CA-NORTHWEST NV WHERE MORE CLOUD COVER IS EXPECTED AND PRECIP POTENTIAL IS HIGHER.

LITTLE CHANGE WAS MADE TO THE FORECAST FOR FRIDAY. AS THE UPPER LOW DRIFTS FARTHER SOUTH ALONG THE CA COAST, THE PRECIP POTENTIAL WILL DECREASE OVER MOST AREAS EXCEPT FOR PARTS OF MINERAL AND MONO COUNTY WHICH MAY BE UNDER A SMALL DEFORMATION ZONE FRIDAY AFTERNOON. MJD

.LONG TERM...SATURDAY THROUGH TUESDAY...
MEDIUM RANGE MODELS HAVE COME INTO MUCH BETTER AGREEMENT THIS

MORNING WITH REGARD TO CLOSED LOW. THEY HAVE TRENDED TOWARD A

POSITION OVER CNTRL-SOUTHERN CA EARLY SATURDAY WITH LOW LIFTING NORTHEASTWARD ACROSS THE GREAT BASIN SUNDAY. GFS ENSEMBLE MEMBERS ARE ALSO SUPPORTIVE OF THIS IDEA. SO WE HAVE MADE SOME SLIGHT ADJUSTMENTS NORTHWARD WITH SHOWERS AND THUNDERSTORMS THIS WEEKEND, GENERALLY TO ABOUT HIGHWAY 50. THIS TRACK WILL ALSO KEEP TEMPERATURES FROM WARMING SIGNIFICANTLY WITH LOWER TO MID 80S MOST LOWER VALLEYS FOR SAT-SUN. AFTER THE WEEKEND, TEMPERATURES WILL CLIMB BACK ABOVE NORMAL AS HEIGHTS RISE. IT WILL BE DRY MON-TUE WITH OCCASIONAL HIGH CLOUDS MAKING THEIR WAY ACROSS THE REGION. HOHMANN

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
240 PM PDT WED SEP 17 2014

.SYNOPSIS...

SMOKE AND HAZE FROM THE KING FIRE WILL CONTINUE TO IMPACT THE AREA THROUGH THIS EVENING. LOW PRESSURE OFF THE WEST COAST WILL BRING COOLER TEMPERATURES WITH A CHANCE OF THUNDERSTORMS THURSDAY. THIS LOW WILL THEN MOVE SLOWLY ACROSS SOUTHERN CALIFORNIA THIS WEEKEND, KEEPING A POSSIBILITY OF THUNDERSTORMS MAINLY SOUTH OF HIGHWAY 50.

&&

.SHORT TERM...
GUSTY WINDS HAVE OVERSPREAD MUCH OF THE SIERRA AND WESTERN NEVADA WITH GUSTS BETWEEN 30-40 MPH REPORTED ACROSS THE REGION. HAZARDOUS BOATING CONDITIONS WILL CONTINUE ACROSS LAKE TAHOE AND PYRAMID LAKE AND A LAKE WIND ADVISORY REMAINS IN PLACE THROUGH THIS EVENING. THESE

WINDS WILL PERSIST THROUGH THE EVENING HOURS WITH GUSTS DIMINISHING AT LOWER ELEVATIONS AFTER MIDNIGHT. ANOTHER ROUND OF SMOKE TRANSPORT FROM THE KING FIRE WILL PUSH ACROSS THE SIERRA AND WESTERN NEVADA THROUGH THIS EVENING, ESPECIALLY NORTHWARD OF HIGHWAY 50 INCLUDING THE RENO-TAHOE VICINITY. REDUCED VISIBILITY AROUND 2-5 MILES AND DIMINISHED AIR QUALITY CAN BE EXPECTED WITH THE ARRIVAL OF WILDFIRE SMOKE.

ISOLATED SHOWERS AND STORMS ARE POSSIBLE MAINLY ACROSS EASTERN PORTIONS OF PERSHING AND CHURCHILL COUNTIES INTO MINERAL AND MONO COUNTIES THIS EVENING WHERE INCREASED MOISTURE TRANSPORT WILL OCCUR AHEAD OF AN UPPER LEVEL LOW. THE LOW WILL PUSH ACROSS NORTHERN CALIFORNIA THURSDAY WHICH WILL BEGIN TO SHIFT WINDS MORE WESTERLY AND WILL STILL ALLOW FOR SMOKE TRANSPORT ACROSS INTO WESTERN NEVADA. COOLING ALOFT WILL HELP PRODUCE MID-LEVEL INSTABILITY ALONG WITH A CHANCE OF SHOWERS AND THUNDERSTORMS ACROSS THE ENTIRE REGION THURSDAY AFTERNOON WITH THE BEST POTENTIAL MAINLY NORTH ACROSS LASSEN COUNTY AND NORTHERN WASHOE COUNTY.

THE AXIS OF THE UPPER LOW WILL SHIFT EASTWARD ON FRIDAY AND WILL ALLOW SURFACE HIGH PRESSURE TO BUILD ACROSS NORTHERN NEVADA. THIS WILL SHIFT WINDS OUT OF THE NORTHEAST WHICH WILL PRODUCE COOLER TEMPERATURES AND WILL HELP KEEP SMOKE MAINLY WEST OF THE SIERRA CREST FRIDAY AFTERNOON. LINGERING MOISTURE WILL PRODUCE SLIGHT CHANCES OF SHOWERS AND STORMS MAINLY ACROSS MONO AND MINERAL COUNTIES. HIGH TEMPERATURES ON THURSDAY AND FRIDAY WILL COOL BUT REMAIN NEAR SEASON AVERAGES WITH LOW TO MID 80S ACROSS WESTERN NEVADA AND LOWER 70S ACROSS THE SIERRA. FUENTES

.LONG TERM...SATURDAY THROUGH WEDNESDAY...

FORECAST MODELS ARE IN FAIRLY GOOD LARGE SCALE AGREEMENT THROUGH THE

LONG TERM PERIOD LEADING TO BETTER THAN AVERAGE FORECASTER CONFIDENCE. A CLOSED LOW SITTING ALONG THE SOUTHERN CALIFORNIA COAST WILL OPEN AND LIFT NORTHEASTWARD ACROSS NEVADA SATURDAY INTO SUNDAY. AS IT DOES SO, IT WILL ADVECT MOISTURE FROM THE SOUTHWEST LEADING TO SHOWERS AND POSSIBLE THUNDERSTORMS MAINLY SOUTHEAST OF A SOUTH LAKE TAHOE-LOVELOCK LINE. THE 12Z EC IS DEVELOPING A BAND OF WRAP AROUND PRECIPITATION ALONG A DEFORMATION ZONE SUNDAY, WHICH WOULD BRING MUCH MORE WIDESPREAD SHOWERS TO NORTHERN NEVADA. THIS IS A DIFFERENT FROM ITS 00Z RUN AND FROM ALL OTHER OPERATIONAL MODELS, SO HAVE LARGELY IGNORED THIS SOLUTION FOR NOW.

A SHORTWAVE RIDGE BUILDS IN BEHIND THE EXITING LOW FOR MONDAY INTO TUESDAY WITH CLEARING SKIES AND TEMPERATURES WARMING A FEW DEGREES. CONFIDENCE DECREASES BY WEDNESDAY, MAINLY DUE TO THE FACT PREVIOUS MODEL RUNS WERE SHOWING A LARGE AREA OF HIGH PRESSURE SETTING UP ALONG THE CALIFORNIA COAST, WHILE THE LATEST RUNS ARE KEEPING THAT SAME HIGH WELL TO THE SOUTH NEAR BAJA CALIFORNIA AND ALLOW A DEEP TROUGH TO SHIFT INTO THE NORTHWEST. CURRENTLY THERE IS MORE SUPPORT FOR THE TROUGH SOLUTION, SO HAVE ADDED SLIGHT CHANCE FOR PRECIPITATION IN THE NORTHERN SIERRA AND NORTHEAST CALIFORNIA ON WEDNESDAY AND COOLED TEMPERATURES A FEW DEGREES. DJ

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
802 PM PDT WED SEP 17 2014

.UPDATE...
WILL UPDATE THIS EVENING TO ALLOW LAKE WIND ADVISORIES TO EXPIRE. PYRAMID LAKE CLOSES AT SUNSET AND WE DO NOT TYPICALLY RUN

ADVISORIES PAST ITS CLOSURE...AND OBSERVATIONS FROM THE SUTCLIFFE

SHOW A DECREASE IN WIND SPEEDS. WINDS HAVE ALSO DECREASED SLIGHTLY
ON LAKE TAHOE...ALTHOUGH THEY REMAIN IN THE MID TEENS WITH GUSTS
IN THE LOWER TO MID 20S. THIS SHOULD DECREASE THROUGH THE LATE
EVENING HOURS.

CONVECTION DEVELOPED EARLIER IN THE FAR EASTERN CWA...EAST OF A
LOVELOCK TO HAWTHORNE LINE. STORMS HAVE BEEN FAST MOVING AND
FAIRLY LOW TOPPED. THE FEATURE RESPONSIBLE FOR THIS CONVECTION IS
QUITE SUBTLE IN SATELLITE IMAGERY...BUT WAS PICKED UP BY CURRENT
NUMERICAL MODELS. MODELS SUGGEST SOME CONVECTION WILL PERSIST
THROUGH THE NIGHT. APPROACH OF LONG WAVE TROUGH INTO CALIFORNIA
MAY DEVELOP SHOWERS OVER THE FAR WESTERN PORTIONS OF THE CWA TONIGHT.

SMOKE FROM THE KING FIRE HAS BECOME MUCH THICKER IN THE
RENO/SPARKS AREA THIS EVENING AS WEST WINDS DEVELOPED AND PUSHED
THE SMOKE THIS WAY. RECENT OBSERVATIONS SHOW THE SMOKE HAS
DECREASED A BIT IN THE TRUCKEE AREA BUT WEB CAMS STILL SHOW SMOKE
IN THE TAHOE-DONNER AREA...SO WILL NOT REMOVE FROM THAT AREA
TONIGHT. BASED ON RADAR RETURNS PLUME IS STILL VERY ACTIVE SO IT
IS LIKELY THAT SMOKE WILL BE A PROBLEM THROUGH THE OVERNIGHT HOURS
FOR PARTS OF WESTERN NEVADA AND NORTHEAST CALIFORNIA. 20

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
335 AM PDT THU SEP 18 2014

.SYNOPSIS...

SMOKE FROM THE KING FIRE WILL AFFECT PARTS OF THE REGION ESPECIALLY

THIS MORNING. AS WINDS SHIFT TO THE EAST FROM FRIDAY THROUGH THE
WEEKEND, SMOKE SHOULD REMAIN WEST OF THE SIERRA CREST. LOW
PRESSURE MOVING INTO NORTHERN CALIFORNIA WILL BRING A CHANCE OF

THUNDERSTORMS TODAY. THUNDERSTORM CHANCES WILL DECREASE FRIDAY AS
THIS LOW MOVES FARTHER SOUTH.

&&

.SHORT TERM...

WHILE SHOWERS HAVE DIMINISHED OVER NORTHWEST NV WITH DEPARTING JET
STREAK, UPPER LOW MOVING INTO NORTHERN CALIFORNIA WILL PRODUCE BETTER
LIFT AND INSTABILITY IN THE AFTERNOON. THE BETTER POTENTIAL FOR
THUNDERSTORMS WILL LIKELY START IN NORTHEAST CA-NORTHWEST NV,
THEN SHIFT TO JUST EAST OF RENO-CARSON CITY AND INTO THE WEST
CENTRAL NV BASIN BY EARLY EVENING. HOWEVER, SLIGHT VARIATIONS IN
THE TRACK OF THE UPPER LOW AND LOCATION OF DEFORMATION ZONE COULD
AFFECT WHERE STORMS WILL DEVELOP, SO WE KEPT AT LEAST A MENTION OF
ISOLATED THUNDER ACROSS THE REGION. CELL MOVEMENT WILL BE RELATIVELY
FAST SO RAINFALL AMOUNTS WILL BE LIMITED.

FOR FRIDAY AND SATURDAY, UPPER LOW IS EXPECTED TO CONTINUE MOVING
SOUTH THEN REMAIN STATIONARY OVER SOUTHERN CA. THE LATEST
GUIDANCE KEEPS THE INSTABILITY AND DEFORMATION ZONE SOUTH OF MONO
AND MINERAL COUNTIES, BUT SINCE THERE HAS BEEN VARIANCE IN THE
TRACK OF THIS LOW, WE WILL NOT REMOVE THE SLIGHT CHANCE OF THUNDER
THAT IS CURRENTLY IN THE FORECAST FOR AREAS SOUTH OF HIGHWAY 50.

AS THE LOW EJECTS INLAND SATURDAY NIGHT, SOME MOISTURE MAY BE
THROWN BACK INTO PARTS OF WEST CENTRAL NV. WHILE THE BETTER
CHANCES OF RAIN SHOWERS SHOULD REMAIN EAST OF HIGHWAY 95 AND SOUTH
OF HIGHWAY 50, SOME OF THE MODELS ESPECIALLY THE ECMWF FAVORED
WRAPPING SOME MOISTURE EVEN AS FAR WEST AS RENO BY LATE SAT NIGHT.

AS FOR THE SMOKE FROM THE KING FIRE, AREAS AFFECTED INCLUDED THE
THE WEST CENTRAL NV BASIN WHERE VISIBILITY HAS RANGED FROM 3-6

MILES. SMOKE HAD LARGELY DISPERSED AROUND RENO AND TRUCKEE FOR MUCH OF THE NIGHT, BUT JUST RETURNED WITHIN THE PAST HOUR FROM A FLARE-UP WHICH OCCURRED EARLIER IN THE NIGHT. MOST OF THIS SMOKE AND HAZE SHOULD DISPERSE BY LATE MORNING AS IT DID YESTERDAY. A SMALLER AREA OF SMOKE CONTINUES TO SPREAD FROM THE KING FIRE SITE ON LATEST RADAR IMAGES.

THERE IS MORE UNCERTAINTY IN HOW MUCH SMOKE WILL SPREAD ACROSS THE SIERRA AND INTO WESTERN NV LATER THIS AFTERNOON AND EVENING. HUMIDITY RECOVERY IS BETTER WEST OF THE CREST AND IS NOT EXPECTED TO DROP AS MUCH TODAY. WINDS WILL NOT BE AS STRONG THIS AFTERNOON WITH A SHIFT IN DIRECTION TO NORTHWEST BY EARLY EVENING, THEN BECOMING EAST AFTER MIDNIGHT. ANOTHER IMPORTANT FACTOR IS THE SURGE IN FIRE FIGHTING PERSONNEL AND RESOURCES WHICH HAVE ARRIVED ON SITE. FOR NOW WE WILL LEAVE OUT MENTION OF SMOKE OR HAZE AFTER 18Z, BUT IT MAY NEED TO BE ADDED IF A LARGE FLARE-UP OCCURS AGAIN TODAY. OVERALL WE WOULD EXPECT LESS COVERAGE AND CONCENTRATION OF SMOKE OVER EASTERN CA-WESTERN NV COMPARED TO THE PREVIOUS FEW DAYS. FOR FRIDAY AND SATURDAY, NORTHEAST TO EAST SURFACE TO MID LEVEL FLOW WILL PREVENT SMOKE FROM THE KING FIRE FROM IMPACTING ANY AREAS EAST OF THE SIERRA CREST.

TEMPERATURES WILL BE ABOUT 10 DEGREES COOLER TODAY WITH HIGHS GENERALLY IN THE LOWER-MID 80S FOR WESTERN NV, AND BELOW 80 IN NORTHEAST CA VALLEYS. ONLY A SLIGHT WARMING IS EXPECTED THRU SATURDAY AS THE UPPER LOW HANGS AROUND SOUTHERN CALIFORNIA. MJD

.LONG TERM...SUNDAY THROUGH WEDNESDAY...

UPPER LOW WILL BE SLOWLY LIFTING OUT SUN-SUN NIGHT WITH NO CHANGE IN THE FORECAST POPS/WX GIVEN GENERAL CONTINUITY IN TRACK OF LOW AMONGST THE OPERATIONAL MODELS THIS MORNING. THE EXCEPTION IS THE

ECMWF WHICH HAS TRENDED FURTHER NORTH AND EVEN HAS WRAP AROUND
BAND SETTING UP ACROSS WESTERN NV AS FAR NORTH AS I-80 SAT NIGHT-
SUN. THIS IS THE SECOND ECMWF RUN TO SHOW THIS AND IT IS WORTH
WATCHING THE NEXT 24 HOURS TO SEE IF IT CONTINUES WITH ITS IDEA
AND OTHER MODELS SHOW A TREND IN ITS FAVOR. FOR NOW, WE MAINTAINED
A SLIGHT CHANCE OF SHOWERS AND THUNDERSTORMS GENERALLY SOUTH OF
HIGHWAY 50 SUNDAY IN SYNC WITH THE SHORT TERM SECTION OF THE FCST
SAT-SAT NIGHT.

SHORTWAVE RIDGE WILL MOVE ACROSS THE AREA MONDAY AND THEN EAST OF
AREA TUESDAY FOR DRY AND WARM CONDITIONS. THE FORECAST IS BEGINNING
TO LOOK A LITTLE MORE LIKE FALL AS WE HEAD INTO WED-THU AS MODELS
ARE LATCHING ON TO A COOLER TROUGH. THERE IS A LARGE RANGE OF
SOLUTIONS WITH REGARD TO PRECIPITATION, AS TIMING AND AMPLITUDE OF
TROUGH IS STILL QUESTIONABLE. THE ECMWF THIS MORNING IS MORE
AMPLIFIED THAN THE GFS/GEM AND THUS SLOWER. AS A RESULT THE ECMWF
IS ALSO WETTER. IT WILL BE INTERESTING TO WATCH THE EVOLUTION OF
MODEL RUNS OVER THE NEXT FEW DAYS. CONFIDENCE IS LOW ON
PRECIPITATION CHANCES AND THEREFORE WE HAVE MAINTAINED ONLY A
SLIGHT CHANCE OF SHOWERS GENERALLY NORTH OF HIGHWAY 50. AFTER A
WARM START TO THE WEEK, TEMPERATURES WILL LIKELY FALL BELOW NORMAL
BY WEDNESDAY OR THURSDAY AS 700 MB TEMPS FALL CLOSE TO 0 C.
CONFIDENCE IS HIGHER WITH THIS ASPECT OF THE FORECAST SO TEMPERATURES
WERE COOLED A BIT WEDNESDAY AND MORE SIGNIFICANTLY THURSDAY IN THE
PRELIMINARY DAY 8 GRIDS. GUSTY WINDS WILL LIKELY PRECEDE TROUGH
FOR TUES-WED. HOHMANN

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
309 PM PDT THU SEP 18 2014

.SYNOPSIS...

SMOKE FROM THE KING FIRE WILL AFFECT PARTS OF THE REGION THROUGH TONIGHT. AS WINDS SHIFT TO THE EAST FROM FRIDAY THROUGH THE WEEKEND, SMOKE WILL REMAIN WEST OF THE SIERRA CREST. LOW PRESSURE MOVING INTO NORTHERN CALIFORNIA WILL BRING A CHANCE OF THUNDERSTORMS TODAY AND TONIGHT. THUNDERSTORM CHANCES WILL DECREASE FRIDAY AS THIS LOW MOVES FARTHER SOUTH.

&&

.SHORT TERM...

UPPER LEVEL LOW CONTINUES TO PUSH DOWN ALONG THE CALIFORNIA COAST THROUGH TONIGHT WITH SOUTHWEST FLOW ALOFT. TEMPERATURES WILL BE A BIT COOLER TODAY AND FRIDAY AS THE LOW BRING DOWN TEMPERATURES ALOFT. BY FRIDAY, THE LOW BECOMES CUT OFF FROM THE MAIN JET OVER THE PAC NORTHWEST AND MEANDERS AROUND THE CALIFORNIA COAST THROUGH THE WEEKEND.

SMOKE FROM THE KING FIRE WEST OF TAHOE WILL CONTINUE TO FLOW INTO THE NORTH TAHOE AND RENO AREAS THROUGH THIS EVENING AND TONIGHT. BY TONIGHT, WINDS WILL BEGIN TO SHIFT TO THE EAST, HELPING TO IMPROVE THE SMOKEY SKIES FRIDAY AND SATURDAY. THERE IS MEDIUM TO HIGH CONFIDENCE THAT THE WINDS WILL REMAIN OUT OF THE EAST THROUGH THE WEEKEND WITH IMPROVING CONDITIONS OVER WESTERN NEVADA. AS FOR LAKE TAHOE THIS WEEKEND, SATURDAY LOOKS PRETTY GOOD FOR EASTERLY WINDS KEEPING SMOKE OUT OF THE BASIN, ALTHOUGH BY SUNDAY THERE MAY BE SOME SMOKE CREEPING BACK INTO THE BASIN LATE IN THE DAY AS LIGHT WESTERLY WINDS RETURN. THIS COULD IMPACT WEEKEND EVENTS

AROUND LAKE TAHOE

AS THE LOW CONTINUES TO DROP SOUTH, A FEW SHOWERS AND

THUNDERSTORMS ARE POSSIBLE LATE THIS AFTERNOON AND TONIGHT IN WESTERN NEVADA. DEFORMATION ZONE OF THE LOW WILL HELP TO CREATE SOME ADDED LIFT IN THE ATMOSPHERE. ANY PRECIPITATION FROM THESE SHOWERS WILL ALSO HELP TO GET SOME OF THE PARTICULATES OUT OF THE AIR AS WELL. THERE MAY BE AN AREA OF HEAVIER PRECIPITATION IN WESTERN NEVADA TONIGHT, THE NAM AND HRRR ARE ACTUALLY STARTING TO SHOW SOME AREAS OF HEAVIER PRECIPITATION ASSOCIATED WITH THIS DEFORMATION ZONE OVERNIGHT. WE WILL HAVE TO KEEP A CLOSE EYE ON THIS POTENTIAL.

BY FRIDAY AND SATURDAY, THE LOW DROPS OFF THE CA COAST SLIGHTLY, BUT HELPS TO BRING SOUTHEAST FLOW AND INCREASED CONVERGENCE/MOISTURE OVER THE EASTERN SIERRA. THIS WILL KEEP A CHANCE OF SHOWERS AND THUNDERSTORMS IN THE FORECAST MAINLY SOUTH OF HIGHWAY 50 ON FRIDAY AND CREEPING UP INTO THE TAHOE BASIN BY SATURDAY AND SATURDAY NIGHT. HOON

.LONG TERM...SUNDAY THROUGH THURSDAY...

THE MAIN CHANGE TO THE LONG TERM FORECAST WAS TO INCREASE CHANCES FOR PRECIPITATION ON SUNDAY. THE CLOSED LOW THAT WAS SITTING OVER SOUTHERN CALIFORNIA WILL BEGIN TO OPEN AND LIFT TOWARD THE NORTHEAST SUNDAY INTO MONDAY. AS IT LIFTS, WRAP AROUND MOISTURE FORMS A BAND OF PRECIPITATION ALONG A DEFORMATION AXIS IN THE NORTHEAST QUADRANT OF THE LOW. YESTERDAY, ONLY THE EC WAS SHOWING THIS SOLUTION, AND WHILE IT IS STILL THE MOST ROBUST, OTHER OPERATIONAL MODELS ARE NOW COMING AROUND TO THIS SOLUTION AS WELL. THEREFORE, POPS WERE INCREASED FOR THE PERIOD, THOUGH DEPENDING ON MODEL TRENDS, IT IS POSSIBLE THEY WILL NEED TO BE BOOSTED FURTHER. WHILE NOT OVERLY IMPRESSIVE, THUNDERSTORMS ARE A POSSIBILITY SUNDAY AFTERNOON DUE TO FORCING FROM THE LOW AND MID-LEVEL INSTABILITY.

SHORTWAVE RIDGING BUILDS IN BEHIND THE EXITING LOW MONDAY INTO

TUESDAY FOR DRY AND STABLE CONDITIONS AND TEMPERATURES NEAR NORMAL.
SOUTHWEST WINDS ARE EXPECTED TO INCREASE WEDNESDAY AND THURSDAY
AHEAD OF AN APPROACHING COLD FRONT AND DEEP TROUGH. IF THE KING FIRE
IS STILL ACTIVELY BURNING, THIS WILL LIKELY BRING ANOTHER LARGE PUSH
OF SMOKE INTO THE SIERRA AND NORTHWEST NEVADA, BUT TIME WILL TELL
HOW THE FIRE EVOLVES. THERE IS DECENT LARGE SCALE MODEL AGREEMENT
WITH THE TROUGH PUSHING INTO NORTHEAST CALIFORNIA AND NORTHWEST
NEVADA ON THURSDAY WITH PRECIPITATION AND MUCH COOLER TEMPERATURES
POSSIBLE. DJ

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
811 PM PDT THU SEP 18 2014

.UPDATE...
WESTERLY WINDS ARE STARTING TO DECREASE OVER WRN NV THIS EVENING
AND BEGINNING A SLOW SHIFT TO THE WNW OR NW. DURING THE LAST HOUR
VISIBILITY HAS STARTED TO IMPROVE OVER THE RENO AREA BUT REMAINS
LOW IN SOME OTHER SPOTS. THE LESSENING OF THE WINDS SHOULD HELP
THIS PROCESS AS LESS SMOKE IS ADVECTED INTO THE REGION THROUGH THE
NIGHT. CONVECTION HAS DECREASED QUITE A BIT OVER WRN NV AND
CHANGES WERE MADE TO DROP THE CONVECTION FOR NE CA LATE THIS
EVENING.

LATEST WATER VAPOR IMAGERY IS SHOWING THE UPPER LOW MAY BE TRYING
TO CLOSE OFF A LITTLE FARTHER WSW THAN ORIGINALLY FORECAST. THIS
WOULD BE IN RESPONSE TO A JET STREAK DIGGING INTO THE BACK SIDE OF
THE TROUGH. THIS WOULD MAKE THE FORECAST A BIT MORE PROBLEMATIC
OVERNIGHT. LATEST NAM STILL WANTS TO DEVELOP PCPN IN A DEFORMATION

BAND OVER WRN NV. THIS WAS MAINTAINED...BUT IF LOW CLOSES OFF
FARTHER WEST THEN WE MAY BE TOO FAR EAST TO SEE MUCH OF THIS PCPN.
AND...THIS COULD ALSO DELAY THE INCREASE IN LOW TO MID LVL EASTERLY

FLOW THAT WOULD HELP TO MOVE THE SMOKE OUT OF OUR AREA. FOR NOW
WILL BANK ON MOST OF THE SMOKE DISSIPATING BY DAYBREAK. 20

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
312 AM PDT FRI SEP 19 2014

.SYNOPSIS...

LINGERING SMOKE AND HAZE WILL CONTINUE TO DECREASE TODAY AS EAST
WINDS PREVAIL OVER THE SIERRA. A FEW THUNDERSTORMS IN WEST CENTRAL
NEVADA THIS MORNING WILL DIMINISH. FOR THIS WEEKEND, THUNDERSTORM
CHANCES INCREASE AGAIN AS LOW PRESSURE MOVES INTO CENTRAL NEVADA.
FOR NEXT WEEK, STRONGER LOW PRESSURE MAY BRING INCREASED WINDS BY
MIDWEEK, THEN A COOLING TREND AND POSSIBLE RAIN LATER IN THE WEEK.

&&

.SHORT TERM...

SHOWERS AND A FEW EMBEDDED THUNDERSTORMS HAVE CONTINUED TO DEVELOP
AND MOVE NORTH ACROSS WEST CENTRAL NV OVERNIGHT, WHILE BRIEF
SHOWERS ALSO POPPED UP IN THE TAHOE BASIN. WEAK SHORTWAVE MOVING
FROM SOUTH CENTRAL CA TO CENTRAL NV APPEARS TO BE KEEPING THIS
ACTIVITY GOING, BUT AS THIS FEATURE MOVES EAST THIS ELEVATED
CONVECTION SHOULD DIMINISH BY MID MORNING.

OTHERWISE, THE MAIN CHANGE FOR TODAY WILL BE PREVAILING EAST FLOW
WHICH WILL KEEP SMOKE FROM THE KING FIRE WEST OF THE SIERRA CREST.
LEFTOVER SMOKE AND HAZE AROUND TRUCKEE AND IN SOME WESTERN NV
VALLEYS MAINLY FROM HIGHWAY 50 SOUTHWARD SHOULD DISPERSE THIS
MORNING AS MIXING HEIGHTS RISE. THE EAST FLOW SHOULD KEEP SMOKE

OUT OF THE REGION AGAIN SATURDAY. MID LEVEL FLOW BECOMES LIGHT ON SUNDAY WITH SOME LIGHT WEST WINDS AT THE SURFACE LATE IN THE DAY MAINLY FOR THE TAHOE BASIN. WHETHER THESE WINDS WILL PUSH SMOKE EAST OF THE CREST AGAIN DEPENDS ON HOW ACTIVE THE KING FIRE IS BURNING ON SUNDAY. AT THIS TIME WE DO NOT EXPECT MUCH SMOKE EAST OF THE SIERRA CREST ON SUNDAY. IF ANY SMOKE DOES MAKE IT OVER, IT WOULD LIKELY BE MUCH LESS CONCENTRATED COMPARED TO THE PAST SEVERAL DAYS, AND NOT ARRIVE UNTIL LATE AFTERNOON OR EARLY EVENING.

OTHER THAN THE MORNING CONVECTION, THE POTENTIAL FOR THUNDERSTORMS TODAY IS SLIM AS MAIN UPPER LOW SETS UP OFF THE SOUTHERN CA COAST. A FEW CELLS MAY DEVELOP NEAR THE CREST SOUTH OF TAHOE THIS AFTERNOON BUT THEY WOULD MOST LIKELY MOVE WEST OF THE CREST BEFORE DISSIPATING BY DUSK.

FOR THIS WEEKEND, THE UPPER LOW IS PROJECTED TO EJECT INLAND ACROSS SOUTHERN CA SATURDAY, THEN TRACK ACROSS CENTRAL NEVADA ON SUNDAY. INSTABILITY AND INCREASING MOISTURE ASSOCIATED WITH THIS LOW WILL BRING POSSIBLE CONVECTION MAINLY SOUTH OF HIGHWAY 50 ON SATURDAY. THE BETTER POTENTIAL FOR RAIN AND THUNDERSTORMS THEN SHIFTS TO WEST CENTRAL NV SATURDAY NIGHT AND SUNDAY AS BANDS OF MOISTURE WRAP AROUND THE LOW CENTER. THIS RAIN POTENTIAL IS STILL PRELIMINARY, AS SOME GUIDANCE SPREADS QPF FARTHER WEST ACROSS RENO-TAHOE AND EVEN NORTHEAST CA, WHILE OTHER GUIDANCE SOURCES FAVOR THE MAJORITY OF THE RAIN AND THUNDER TO REMAIN OVER CENTRAL AND EASTERN NV.

DAYTIME HIGHS WILL REMAIN ABOVE NORMAL THRU SATURDAY, BUT WIDESPREAD 90 DEGREE TEMPS ARE UNLIKELY FOR THE LOWER ELEVATIONS. BY SUNDAY, THE INCREASED CLOUD COVER AND PRECIP CHANCES SHOULD BRING TEMPS DOWN CLOSER TO SEASONAL NORMALS OF LOWER 80S IN WESTERN NV AND 70S FOR MOST SIERRA VALLEYS. MJD

.LONG TERM...SUNDAY THROUGH THURSDAY...

FEW CHANGES MADE TO THE LONG TERM WITH DRY CONDITIONS EARLY IN THE WEEK IN THE WAKE OF THE DEPARTING LOW. THEN THE NEXT TROUGH WILL MOVE TOWARD THE WEST COAST WEDNESDAY AND THURSDAY. THE MODELS ARE IN GOOD AGREEMENT WITH THE LONG WAVE PATTERN NOW, WITH THE BIGGEST DIFFERENCES IN THE DETAILS OF THE MID TO LATE WEEK TROUGH.

FOR MONDAY/TUESDAY, LIGHT SOUTHWEST FLOW IS EXPECTED BETWEEN THE EAST PACIFIC LOW AND WEAK RIDGING OVER NORTHERN MEXICO. EXPECT TYPICAL AFTERNOON SW BREEZES WITH PEAK GUSTS TO 25 MPH AND TEMPS A FEW DEGREES ABOVE AVERAGE.

THEN THE TROUGH BEGINS TO MOVE TOWARD THE COAST WITH THE GFS FASTER AND WETTER, WHILE THE EC IS SLOWER AND SHOWS A BIT MORE OF A SPLIT AS THE TROUGH MOVES ONSHORE. EITHER WAY, IT LOOKS TO BE WINDY WEDNESDAY AS H7 WINDS INCREASE TO 30 KTS OR MORE WITH A GOOD THERMAL GRADIENT. INCREASED THE WINDS A BIT DUE TO THE CONSISTENCY AND MODEL AGREEMENT HERE. MOVING INTO THURSDAY, THE GFS PUSHES THE COLD FRONT THROUGH WHILE THE EC KEEPS THE TROUGH OFFSHORE AS ANOTHER SHORT WAVE ROUNDS THE BASE. HAVE SPLIT THE DIFFERENCE HERE BETWEEN THE MODELS ALTHOUGH THERE IS MORE SUPPORT FOR THE GFS AS OF THIS WRITING. STILL, MY GUT IS TELLING ME THE EC WILL END UP BEING MORE CORRECT IF THE MODELS CONTINUE WITH THE SPLITTING SOLUTION.

CONTINUED THE SLIGHT CHANCE OF SHOWERS BEGINNING WEDNESDAY AFTERNOON

ACROSS NORTHEAST CALIFORNIA SPREADING TO ALL AREAS NORTH OF HIGHWAY 50 THURSDAY. WARMED TEMPS ON WEDNESDAY SOUTH AND EAST OF A PORTOLA TO GERLACH LINE WITH GOOD DOWNSLOPE WARMING AHEAD OF THE FRONT. CONTINUED THE SHARP COOLDOWN FOR THURSDAY, BUT IT MAY END UP BEING WARMER THAN WE HAVE ADVERTISED IF THE EC AND SPLITTING SOLUTIONS

VERIFY. WALLMANN

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
235 PM PDT FRI SEP 19 2014

.SYNOPSIS...

SMOKE AND HAZE WILL CONTINUE TO DECREASE THIS EVENING AS EAST WINDS PREVAIL OVER THE SIERRA. THUNDERSTORM CHANCES INCREASE THIS WEEKEND AS LOW PRESSURE MOVES INTO NEVADA. FOR NEXT WEEK, STRONGER LOW PRESSURE MAY BRING INCREASED SOUTHWEST WINDS BY MIDWEEK WITH COOLER TEMPERATURES LATE IN THE WEEK.

&&

.SHORT TERM...

LOW PRESSURE OFF THE CENTRAL CALIFORNIA COAST HAS SHIFTED WINDS TO THE EAST TODAY, HELPING TO IMPROVE AIR QUALITY OVER THE EASTERN SIERRA AND WESTERN NEVADA. SMOKE FROM THE KING FIRE WILL CONTINUE TO PUSH INTO THE SACRAMENTO VALLEY THIS WEEKEND, AS WINDS FLOW REMAINS OUT OF THE EAST. AIR QUALITY SHOULD REMAIN BETTER THROUGH THE WEEKEND, ALTHOUGH DID KEEP A MENTION OF HAZE IN THE FORECAST THROUGH SATURDAY EVENING AS THE LIGHT WINDS WON'T BE ABLE TO FULLY SCOUR OUT THE VALLEYS OF WESTERN NEVADA. BY LATE SUNDAY AFTERNOON, WEAK WEST WINDS WILL PUSH INTO THE TAHOE BASIN WHICH COULD PUSH SOME SMOKE

INTO THE AREA.

AS FOR THUNDERSTORM ACTIVITY, WE DID SEE SOME SHOWERS AND EMBEDDED THUNDERSTORMS LAST NIGHT AS THE DEFORMATION ZONE PUSHED OVER WESTERN NEVADA. WE MAY SEE SOME WEAK CONVECTIVE DEVELOPMENT THIS AFTERNOON

ALONG THE SIERRA CREST, ALTHOUGH UNDER EAST FLOW ANY STORMS SHOULD REMAIN CONFINED TO THE SIERRA CREST AND WESTWARD.

CHANCES FOR CONVECTION INCREASE EVEN MORE SATURDAY INTO SUNDAY AS THE UPPER LOW LIFTS OUT OF CENTRAL CALIFORNIA AND INTO THE GREAT BASIN. THIS WILL BRING SHOWERS AND THUNDERSTORMS TO MUCH OF WEST-CENTRAL NEVADA AND THE EASTERN SIERRA LATE SATURDAY, THEN TRANSITIONING NORTHWARD SATURDAY NIGHT WITH A FEW SHOWERS OVERNIGHT. BY SUNDAY AFTERNOON, AS THE COLD POOL ALOFT DESTABILIZES THE ATMOSPHERE, SCATTERED TO ISOLATED THUNDERSTORMS WILL DEVELOP FOR MUCH OF THE FORECAST AREA. WE'VE EXTENDED THE HIGHER CHANCES FOR THUNDERSTORMS INTO THE SIERRA ZONES ON SUNDAY AS THE LATEST RUNS OF THE GFS/NAM ARE SHOWING BETTER CHANCES IN RECENT MODEL RUNS. HOON

.LONG TERM...MONDAY THROUGH FRIDAY...

VERY FEW CHANGES WERE MADE TO THE ONGOING FORECAST WITH MODELS IN DECENT LARGE SCALE AGREEMENT AND THE BIGGEST DIFFERENCES SHOWING UP HEADING INTO NEXT WEEKEND. SHORTWAVE RIDGING BUILDS IN FOR MONDAY BEHIND THE WEEKEND'S EXITING LOW BRINGING DRY CONDITIONS AND TEMPERATURES ABOUT 5 DEGREES ABOVE AVERAGE. SOUTHWEST FLOW RETURNS OVER THE REGION MONDAY INTO TUESDAY, BECOMING STRONGER WEDNESDAY AND THURSDAY AHEAD OF A DEEP TROUGH WHICH DIGS DOWN THE THE WEST COAST. CURRENTLY, IT LOOKS LIKE WEDNESDAY WILL HAVE THE STRONGEST WINDS WITH 700 MB WINDS PEAKING AROUND 40-50 MPH, THOUGH THURSDAY WILL BE QUITE BREEZY AS WELL. THESE WINDS WILL LIKELY BRING SMOKE FROM THE KING FIRE BACK INTO THE SIERRA AND WESTERN NEVADA, BUT IT IS ALL DEPENDENT ON FIRE ACTIVITY THE NEXT SEVERAL DAYS.

MODELS HAVE BEEN IN GOOD AGREEMENT WITH THE INITIAL PRECIPITATION BAND ASSOCIATED WITH THE AFOREMENTIONED LOW REACHING THE NORTHERN SIERRA THURSDAY MORNING. HOWEVER, THEY DO DIVERGE IN THEIR SOLUTIONS FOR HOW THE LOW PROGRESSES THROUGH THE REGION. THE 00Z EC WAS

LOOKING LIKE IT MIGHT SPLIT THE TROUGH, WHILE THE 12Z EC IS MUCH FASTER TO SHIFT THE LOW THROUGH THE REGION WITH A SECONDARY PIECE OF ENERGY MOVING INTO THE NORTHWEST FOR THE WEEKEND. THE PAST TWO RUNS OF THE GFS HAVE BEEN TRYING TO DROP THE LOW THROUGH THE GREAT BASIN, CLOSING IT OFF OVER UTAH...WHICH IS MUCH DIFFERENT THAN YESTERDAY'S MODEL RUNS WHICH TOOK IT THOUGH THE NORTHWEST INTO THE NORTHERN ROCKIES. FOR NOW WILL MAINTAIN BELOW NORMAL TEMPERATURES AND SLIGHT CHANCES FOR PRECIPITATION FOR THURSDAY AND FRIDAY. DJ

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
752 PM PDT FRI SEP 19 2014

.UPDATE...
CONVECTION COULD NEVER GET BEYOND THE MODERATE CU STAGE TODAY AS INSTABILITY WAS LACKING. THIS SHOULD BE THE CASE THROUGH THE NIGHT SO HAVE REMOVED EVENING POPS FOR THE AREA. KEPT THE MENTION OF HAZE IN MANY PLACES AS EASTERLY GRADIENT IS STILL NOT QUITE STRONG ENOUGH TO GET ALL OF THE RESIDUAL EFFECTS OF THE SMOKE FROM THR KING FIRE OUT OF THE AREA.

ATMOSPHERE SHOULD BECOME MORE UNSTABLE SATURDAY AS LOW LVL FLOW BECOMES MORE SE AND DRAWS A LITTLE MOISTURE INTO THE REGION WHILE UPPER LOW OFF THE CA COAST STARTS TO EJECT TO THE NORTHEAST. THIS WILL BRING SOME COOLING ALOFT AND AID IN PRODUCING INSTABILITY. SO

THUNDERSTORM COVERAGE WILL LIKELY NEED TO BE EXPANDED FOR SATURDAY. 20

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV

253 AM PDT SAT SEP 20 2014

.SYNOPSIS...

LOW PRESSURE MOVING NORTHEAST ACROSS CALIFORNIA AND NEVADA THIS WEEKEND WILL PRODUCE SHOWERS AND THUNDERSTORMS LATER TODAY, WITH THE BEST CHANCES FOR RAIN TONIGHT THROUGH SUNDAY AFTERNOON. WARMER AND DRIER CONDITIONS ARE EXPECTED MONDAY AND TUESDAY, THEN A STRONGER LOW PRESSURE WILL BRING INCREASING WINDS, FOLLOWED BY A COOLING TREND WITH POSSIBLE RAIN LATER IN THE WEEK.
&&

.SHORT TERM...

UPPER LOW OFF THE SOUTHERN CA COAST WILL EJECT INLAND ACROSS THE SAN JOAQUIN VALLEY LATER TODAY, THEN CONTINUE TRACKING NORTHEAST ACROSS CENTRAL NV ON SUNDAY. SHORT TERM GUIDANCE IS IN REASONABLY GOOD AGREEMENT FOR THIS SCENARIO, WHICH WOULD LEAD TO DEVELOPMENT OF ISOLATED TO SCATTERED CONVECTION MAINLY NEAR THE SIERRA AND IN WEST CENTRAL NV FROM HIGHWAY 95 EASTWARD THIS AFTERNOON.

THE MAIN IMPACT OF THIS LOW WILL BE NOTICED TONIGHT AND SUNDAY AS VERY MOIST AIR MASS IS PULLED IN FROM THE SOUTHWEST US. PRECIPITABLE WATER VALUES INCREASE TO NEAR 1 INCH ACROSS MUCH OF WESTERN NV THIS EVENING AND CONTINUE NEAR THOSE VALUES THRU MOST OF SUNDAY. FORCING WILL ALSO BECOME STRONGER WITH DEFORMATION ZONE AHEAD OF THE UPPER LOW TRACK, WHILE COLD POOL ALOFT WILL PROVIDE INSTABILITY FOR

GENERATING AND SUSTAINING SOME CONVECTION EVEN DURING THE OVERNIGHT AND MORNING HOURS. THE GENERAL CONSENSUS FOR BEST RAIN CHANCE IS FOR PERSHING AND CHURCHILL COUNTIES WITH POSSIBLE RAINFALL TOTALS BETWEEN 0.50 AND 1 INCH, SO WE HAVE INCREASED POPS THE MOST IN THOSE AREAS.

OTHER PARTS OF WESTERN NV AND EASTERN CA, ESPECIALLY SOUTH OF SUSANVILLE AND INTO THE RENO-TAHOE VICINITY COULD RECEIVE SOME DECENT RAINFALL IN THE 0.10 TO 0.25 INCH RANGE WITH LOCALLY HIGHER AMOUNTS LATER TONIGHT THROUGH SUNDAY. THIS WILL BE HIGHLY DEPENDENT ON LOCATION AND DURATION OF THE MOISTURE BAND AS IT WRAPS AROUND THE UPPER LOW MOVING ACROSS NEVADA.

WIDESPREAD CLOUD COVER AND ONGOING AREAS OF RAIN IN THE MORNING, FOLLOWED BY ADDITIONAL CONVECTION IN THE AFTERNOON WILL LIMIT TEMPERATURE RISES ON SUNDAY. HIGHS HAVE BEEN LOWERED TO THE MID TO UPPER 70S FOR MOST OF WESTERN NV, ALTHOUGH SOME LOCATIONS COULD END UP WITH A PERSISTENT BAND OF RAIN AND END UP 5-10 DEGREES COOLER.

FOR SUNDAY NIGHT, PRECIP WILL DECREASE QUICKLY DURING THE EVENING AS THE LOW ACCELERATES TO THE NORTHEAST AND EXITS NORTHEAST NV BY MIDNIGHT. FOR MONDAY, SHORTWAVE RIDGE MOVES ACROSS THE REGION, BRINGING DRY CONDITIONS AND WARMER TEMPS WITH HIGHS WELL INTO THE 80S FOR MOST WESTERN NV VALLEYS.

WHILE THE KING FIRE WILL CONTINUE TO BURN THRU THIS WEEKEND, THE PRIMARILY EAST LOW-MID LEVEL FLOW SHOULD KEEP SMOKE WEST OF THE SIERRA TODAY AND SUNDAY. SOUTHWEST FLOW ALOFT RETURNS MONDAY AND DEPENDING ON HOW ACTIVE THE FIRE IS BURNING, SMOKE AND HAZE MAY RETURN TO AREAS AFFECTED EARLIER IN THE WEEK, INCLUDING THE RENO AND TRUCKEE VICINITY. MJD

.LONG TERM...TUESDAY THROUGH FRIDAY...

THE MODELS ARE IN DECENT AGREEMENT THIS MORNING WITH THE SLOW MOVEMENT OF THE TROUGH ONSHORE NEXT WEEK. THERE IS STILL A GREAT DEAL OF UNCERTAINTY IN THE DETAILS, ESPECIALLY WHEN LOOKING AT THE

EC ENSEMBLE SPREAD AND STANDARD DEVIATION. HOWEVER, THE MEANS FROM BOTH THE GFS/EC SUPPORT THE GENERAL IDEA OF THE TROUGH SPLITTING AS IT MOVES ONSHORE WITH A POTENTIAL CLOSED LOW MOVING THROUGH AS THE GFS/EC DETERMINISTIC RUNS SHOW. SINCE THE FORECAST IN GENERAL CONVEYS THIS IDEA, ONLY MADE A FEW MINOR CHANGES.

TUESDAY LOOKS TO BE THE WARMEST DAY OF THE WEEK AS THE SHORT WAVE RIDGE MOVES TO THE EAST AND A MILD SOUTHWEST FLOW IS EXPECTED AHEAD OF THE TROUGH. WINDS WILL INCREASE FURTHER WEDNESDAY WITH POSSIBLE GUSTS TO 45 MPH AS 700 MB WINDS INCREASE TO 30-40 KTS. ONE CHANGE WAS TO REMOVE ANY SHOWERS FROM WEDNESDAY AS THE LEADING EDGE OF THE PRECIP WILL JUST BE MOVING ONSHORE AT THIS TIME PER ENSEMBLE IDEAS.

WINDS WILL STAY UP WEDNESDAY NIGHT AS THE COLD FRONT APPROACHES WITH THE MAIN COLD FRONT MOVING THROUGH ANY TIME FROM THURSDAY AFTERNOON THROUGH FRIDAY MORNING. WINDS WILL REMAIN STRONG AND GUSTY AHEAD OF THE FRONT AND BECOME MORE WEST AND SLACKEN BEHIND IT. AS FAR AS PRECIP, THE FRONT WILL BE SHEARING AS IT MOVES THROUGH SO ONLY EXPECT A FEW SHOWERS. THE UPPER LOW MAY MOVE THROUGH FRIDAY OR SATURDAY, BUT THE COLD AIR LOOKS TO BE IN PLACE. SHOWERS WILL CONTINUE WITH THE BEST CHANCE NORTH OF I-80. TEMPERATURES SHOULD BE MUCH COOLER, DROPPING AS MUCH AS 10 DEGREES BELOW AVERAGE FOR FRIDAY. WALLMANN

AREA FORECAST DISCUSSION...UPDATED

NATIONAL WEATHER SERVICE RENO NV
803 AM PDT SAT SEP 20 2014

.UPDATE...
MADE A QUICK UPDATE TO THE FORECAST FOR THIS AFTERNOON. WE PULLED IN SOME ISOLATED SHOWERS AND THUNDERSTORMS A BIT FURTHER NORTH

INTO RENO AND UP TO PYRAMID LAKE, AS WELL AS INCREASING COVERAGE
TO SCATTERED SHOWERS AND THUNDERSTORMS FOR AREAS EAST OF HIGHWAY
95 IN PERSHING AND CHURCHILL COUNTIES. OTHERWISE, SOLID RAIN
AMOUNTS LOOKING GOOD FOR TONIGHT THROUGH SUNDAY FOR MUCH OF THE
EASTERN SIERRA AND WESTERN NEVADA AS THE DEFORMATION ZONE FROM THE
LOW MOVING THROUGH GREAT BASIN. HOON

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
325 PM PDT SAT SEP 20 2014

.SYNOPSIS...
LOW PRESSURE MOVING NORTHEAST ACROSS CALIFORNIA AND NEVADA THIS
WEEKEND WILL PRODUCE SHOWERS AND THUNDERSTORMS THIS EVENING, WITH
THE BEST CHANCES FOR RAIN TONIGHT THROUGH SUNDAY AFTERNOON. WARMER
AND DRIER CONDITIONS ARE EXPECTED MONDAY AND TUESDAY, THEN A
STRONGER LOW PRESSURE WILL BRING INCREASING WINDS BY MID WEEK.

&&

.SHORT TERM...
UPPER LEVEL LOW PRESSURE OVER CENTRAL CALIFORNIA HAS BEGUN TO LIFT
INTO NEVADA THIS AFTERNOON. SCATTERED THUNDERSTORMS HAVE ALREADY

DEVELOPED OVER EASTERN PERSHING AND CHURCHILL COUNTIES AND WILL
CONTINUE TO EXPAND FURTHER NORTH AND WEST THROUGH THE LATE AFTERNOON
AND EVENING HOURS. A FEW STRONGER STORMS MAY BE POSSIBLE LATE TODAY
IN WEST-CENTRAL NEVADA WHERE THERE IS HIGHER EFFECTIVE BULK SHEAR
AND MUCAPE APPROACHING 1000 J/KG. SMALL HAIL AND STRONG WINDS WILL
BE THE MAIN THREATS.

LIGHT WESTERLY WINDS ARE PUSHING SMOKE FROM THE KING FIRE UP THE

WESTERN SLOPES AND NEAR THE SIERRA CREST THIS AFTERNOON, WHILE EAST WINDS GUSTING AROUND 25 MPH REMAIN OVER THE SIERRA CREST. THERE IS A POSSIBILITY THAT SOME SMOKE WILL MAKE IT OVER THE CREST AND PUSH INTO THE BASIN LATE THIS AFTERNOON BUT IT WILL BE LIMITED DUE TO EAST FLOW ALOFT.

TONIGHT, AS THE LOW PRESSURE CONTINUES TO LIFT THROUGH THE REGION, WE WILL SEE INCREASING PRECIPITABLE WATER TO AROUND ONE INCH IN WESTERN NEVADA. THIS DEEP MOISTURE IS EXTREMELY ANOMALOUS FOR LATE SEPTEMBER, NEARING THE 99TH PERCENTILE FOR PRECIPITABLE WATER IN WESTERN NEVADA...CLOSER TO SOMETHING WE'D SEE IN JULY OR AUGUST.

WIDESPREAD RAIN SHOWERS WILL DEVELOP THIS EVENING AND OVERNIGHT, CONTINUING INTO SUNDAY MORNING. A DEFORMATION ZONE RAIN BAND WILL ALSO SET UP FROM RENO-TAHOE TO WINNEMUCCA OVERNIGHT WITH STEADY LIGHT TO MODERATE RAINFALL INTO SUNDAY MORNING. RAINFALL TOTALS OVERNIGHT AND INTO SUNDAY AFTERNOON MAY EXCEED 0.50" IN EASTERN PERSHING AND CHURCHILL COUNTIES, WITH 0.10 TO 0.25" IN THE EASTERN SIERRA AND ALONG THE WESTERN NEVADA SIERRA FRONT ESPECIALLY AROUND THE INTERSTATE 80 CORRIDOR. THESE RAINFALL AMOUNTS WILL BE HIGHLY DEPENDENT ON WHERE THE DEFORMATION BAND SETS UP OVER THE REGION, WHICH COULD SHIFT UP TO 50 MILES BASED OFF OF PREVIOUS EXPERIENCE.

WIDESPREAD CLOUDS AND SHOWERS ON SUNDAY WILL KEEP TEMPERATURES COOLER. COLD AIR ALOFT WILL KEEP THE ATMOSPHERE UNSTABLE ENOUGH FOR SCATTERED SHOWERS AND THUNDERSTORMS ACROSS MOST OF THE FORECAST AREA. CONVECTION WILL WIND DOWN QUICKLY SUNDAY EVENING AS THE LOW MOVES OUT OF THE AREA AND ALLOWS FOR SHORTWAVE RIDGING TO BUILD OVER THE REGION THROUGH MONDAY.

WINDS FOR THE TAHOE BASIN ARE EXPECTED TO BECOME LIGHT WESTERLY LATE SUNDAY, WHICH WOULD HELP TO BRING SMOKE INTO THE RENO-TAHOE AREA AGAIN SUNDAY EVENING AND MONDAY AS WELL. HOON

.LONG TERM...TUESDAY THROUGH SATURDAY...
THE LARGE SCALE PATTERN IN THE EXTENDED WILL FOCUS ON THE
PROGRESSION OF AN UPPER LEVEL TROUGH. ENSEMBLES AND DETERMINISTIC
MODELS ARE IN GOOD AGREEMENT WITH THE DEVELOPMENT OF THIS TROUGH BUT
FAR GREATER UNCERTAINTY EXISTS WITH ITS INLAND PROGRESSION AND
RESULTANT TIMING OF IMPACTS. NONETHELESS WE CAN EXPECT AN INCREASE
IN WIND SPEEDS ALONG WITH INCREASED SOUTHWESTERLY FLOW ALOFT
THOROUGH AT LEAST THURSDAY. THIS WILL ALLOW SMOKE FROM THE KING FIRE
TO BE TRANSPORTED BACK ACROSS THE EASTERN SIERRA AND WESTERN NEVADA
DEPENDENT UPON THE FIRE'S SMOKE PRODUCTION AT THAT TIME.

MODELS IN GENERAL AGREEMENT TUESDAY AND WEDNESDAY WITH A DRY
SOUTHWEST FLOW IN PLACE ACROSS THE SIERRA AND WESTERN NEVADA. LATEST
GUIDANCE HAS TRENDED A TAD SLOWER WITH THE INLAND PROGRESSION OF THE
TROUGH AND WITH A DRY SLOT ACROSS THE AREA HAVE REDUCED SKY COVER
AND POPS THROUGH THIS PERIOD. LIGHT SOUTHWEST WINDS WILL DEVELOP
LATE TUESDAY WITH BREEZIER CONDITIONS EXPECTED BY WEDNESDAY
AFTERNOON ESPECIALLY TOWARDS THE OREGON BORDER AS AN UPPER LEVEL
JET MOVES IN FROM THE NORTH. TEMPERATURES WILL STAY WARM WITH HIGH
TEMPERATURES IN THE UPPER 80S ACROSS WESTERN NEVADA AND UPPER 70S
ACROSS THE SIERRA.

BEYOND THURSDAY CONSIDERABLE UNCERTAINTY ENTERS THE FORECAST AS THE
GFS BECOMES MORE PROGRESSIVE WITH THE LOW WHILE THE EC LINGERS A
CLOSED LOW OVER THE WEST INTO NEXT WEEKEND. THIS WILL HAVE TIMING
IMPACTS ON THE PASSAGE OF A COLD FRONT ANYWHERE FROM THURSDAY
AFTERNOON INTO THE LATE FRIDAY TIMEFRAME. AHEAD OF THE FRONT WE WILL
SEE LIKELY OUR STRONGEST PRESSURE GRADIENT AND STRONGEST WINDS AS A
RESULT. SUSTAINED WINDS IN THE 15-25 MPH ARE POSSIBLE WITH THIS
GRADIENT BUT THIS THIS WILL LIKELY BE ADJUSTED IN THE COMING DAYS

WITH MORE REFINEMENTS ON TIMING. NONETHELESS, THE LOW WILL HELP COOL
TEMPERATURES ALOFT CREATING INSTABILITY AND CHANCES FOR SHOWERS
BEGINNING THURSDAY INTO NEXT WEEKEND. COOLER TEMPERATURES ARE
ALSO EXPECTED WITH HIGHS AROUND 10 DEGREES BELOW AVERAGE POSSIBLE
BY FRIDAY. FUENTES

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
739 PM PDT SAT SEP 20 2014

.UPDATE...
CONVECTION THIS EVENING IS MAINLY CLUSTERED IN TWO AREAS. THE
CONVECTION ALONG THE CREST AND TO THE WEST IS MORE ASSOCIATED
WITH THE LEADING EDGE OF THE UPPER LOW...ITS COOLER AIR ALOFT AND
INCREASING INSTABILITY. MEANWHILE...A LARGER AREA OF CONVECTION
OVER THE CENTRAL PART OF NEVADA HAS BEEN MORE CLOSELY ASSOCIATED
WITH A JET STREAK IN THAT REGION. LATEST NUMERICAL MODELS TAKE
THIS JET STREAK A BIT MORE WNW AS THE UPPER LOW APPROACHES
TONIGHT. THIS SHOULD ALLOW FOR BETTER FORCING ALOFT OVER WRN
NEVADA. ALSO...THE PRESENCE OF THE UPPER LOW AND ITS COOLING ALOFT
SHOULD BOOST THE CHANCES FOR CONVECTION OVER THE FAR WESTERN AND
SRN CWA. SO...HAVE OPTED TO LOWER POPS SLIGHTLY FOR THE EVENING
OVER WESTERN NEVADA AND NORTHEAST CALIFORNIA WHERE FORCING IS
MINIMAL...BUT LEFT THE HIGHER POPS OVERNIGHT AS THE LOW APPROACHES

AND THE INTERACTION OF THE UPPER JET STREAK AND DEFORMATION AXIS
PRODUCES A BETTER CHANCE FOR RAIN AND EMBEDDED THUNDER.

SMOKE FORM THE KING FIRE POURED INTO THE TAHOE BASIN LATE THIS
AFTERNOON AND EARLY THIS EVENING AS WINDS ALOFT DECREASED FROM THE
EAST AND HAVE STARTING TO BECOME WESTERLY OVER THE BASIN. THESE
WINDS SHOULD EVENTUALLY TURN TO THE WEST OVER SOUTHERN PARTS OF
WRN NV AS WELL...BUT IT IS HARD TO SAY AT THIS POINT WHETHER THE

SMOKE WILL MAKE IT INTO AREAS SOUTH OF CARSON CITY AS STRONG AS
IT WAS IN TAHOE EARLIER. BY SUNDAY MOST LOCATIONS WILL SEE WEST TO
SOUTHWEST WINDS ABOVE THE SURFACE AND THERE IS A BETTER CHANCE OF
THE SMOKE MAKING ITS WAY INTO WRN NEVADA FROM CARSON CITY NORTHWARD.
20

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
303 AM PDT SUN SEP 21 2014

.SYNOPSIS...

LOW PRESSURE MOVING ACROSS NEVADA WILL KEEP THE THREAT OF SHOWERS
AND THUNDERSTORMS OVER THE REGION TODAY WITH BELOW NORMAL
TEMPERATURES. HIGH PRESSURE WILL THEN BRING WARMER AND DRIER
CONDITIONS TO THE REGION THROUGH THE MIDDLE OF THE WEEK, THEN
STRONGER LOW PRESSURE BRINGS INCREASING WINDS AND COOLER
TEMPERATURES WITH POSSIBLE RAIN LATER IN THE WEEK.

&&

.SHORT TERM...

SO FAR THE ONLY MEANINGFUL RAINFALL HAS OCCURRED IN EASTERN
CHURCHILL COUNTY WHERE A FEW LOCATIONS RECEIVED UP TO 0.50 INCH,
AND FAR SOUTHERN MONO COUNTY REPORTING AROUND 0.25 INCH. OTHERWISE
RAINFALL HAS BEEN SPARSE WITH RAIN BANDS UNABLE TO HOLD TOGETHER
EXCEPT IN WEST CENTRAL NV.

THE KEY OPPORTUNITY FOR RAIN WRAPPING INTO THE RENO AND TAHOE
VICINITY WILL BE DURING THE MID AND MORNING HOURS BETWEEN 6 AND 11
AM. THIS TIME PERIOD HAD OFTEN BEEN TARGETED FOR THE BEST RAIN
CHANCES, ALTHOUGH THE LATEST NAM AND HRRR GUIDANCE INDICATE A

NARROWER AND WEAKER RAIN BAND COMPARED TO PREVIOUS RUNS. THE
TRADE-OFF OF LESS RAIN AND CLOUD COVERAGE IN THE MORNING COULD BE
INCREASING SHOWER ACTIVITY WITH ISOLATED THUNDERSTORMS IN THE
AFTERNOON, BUT THAT WOULD MAKE RAINFALL MORE HIT OR MISS OVER THE
REGION.

THE PRECIP WILL WIND DOWN THIS EVENING AS THE UPPER LOW MOVES TO
THE NORTHEAST AND EXITS NORTHEAST NV. DRY CONDITIONS WITH A RETURN
TO ABOVE NORMAL HIGH TEMPS IN THE MID-UPPER 80S FOR LOWER
ELEVATIONS ARE EXPECTED FOR MONDAY AND TUESDAY, AS RIDGE AXIS
MOVES INTO THE GREAT BASIN.

SMOKE FROM THE KING FIRE RETURNED TO TRUCKEE AND PARTS OF THE
TAHOE BASIN AFTER 3 PM YESTERDAY, WITH SOME SMOKE PERSISTING EARLY
THIS MORNING ESPECIALLY BETWEEN THE NORTH SHORE OF TAHOE TO
INTERSTATE 80. ALTHOUGH ADDITIONAL SMOKE IS UNLIKELY TO SPREAD
EAST OF THE SIERRA CREST UNTIL LATER IN THE DAY, IT MAY BE
DIFFICULT TO FULLY SCOUR OUT THE EXISTING SMOKE ESPECIALLY IF
STEADY RAIN MISSES THESE AREAS. FLOW ALOFT BECOMES SOUTHWEST
AGAIN MONDAY WITH WEAK ZEPHYR BREEZE RETURNING BY LATE AFTERNOON,
AND A SLIGHT INCREASE IN WINDS TUESDAY. THIS COULD BRING MORE
SMOKE EAST OF THE SIERRA CREST AND INTO WESTERN NV IF THE KING

FIRE IS STILL BURNING ACTIVELY THROUGH HEAVY TIMBER. MJD

.LONG TERM...WEDNESDAY THROUGH SATURDAY...

THE EAST PACIFIC TROUGH AND ITS MOVEMENT WILL CONTINUE TO BE THE
FOCUS FOR THE LATTER HALF OF THE WEEK WITH THE MODELS A BIT SLOWER
THIS MORNING. THE EC CONTINUES TO BE SLOWER THAN THE GFS WITH THE
PROGRESSION BY 24-36 HOURS THIS MORNING. HAVE GENERALLY GONE WITH A
BLEND, BUT I AM STARTING TO LEAN MORE TOWARD THE EC. THEIR ENSEMBLES
SUPPORT THEIR RESPECTIVE DETERMINISTIC SOLUTIONS, BUT PREFER THE EC

ENSEMBLE IDEAS DUE TO THE GREATER NUMBER OF MEMBERS. IT ALSO SHOWS THE GREATEST UNCERTAINTY IS MORE WITH THE DEPTH OF THE TROUGH AND NOT AS MUCH ON SPEED THIS MORNING.

WEDNESDAY CONTINUES TO LOOK A BIT BREEZY BUT NOT AS MUCH SO WITH THE SLOWER TIMING. IT APPEARS THE STRONGEST WINDS WILL OCCUR MORE WEDNESDAY NIGHT INTO THURSDAY BEFORE THE FRONT MOVES THROUGH. THE GFS/EC ARE ONLY ABOUT 12 HOURS DIFFERENT WITH THE FRONT MOVING THROUGH AND CONTINUED THE CHANCE POPS IN THE SIERRA NORTH OF TAHOE INTO NORTHERN WASHOE THU/THU NIGHT WITH SLIGHT CHANCE FARTHER EAST. BEHIND THE FRONT, IT LOOKS MUCH COOLER AND SHOWERY FRIDAY ON BOTH MODELS WITH THE SHOWERS CONTINUING INTO THE WEEKEND PER THE EC. SNOW LEVELS WILL FALL TO NEAR 9000 FEET OR SO BEHIND THE FRONT SO SOME PEAKS MAY SEE A LIGHT CAPPING OF WHITE BY SATURDAY/SUNDAY MORNING. GIVEN THE UNCERTAINTY, KEPT THE THREAT OF SHOWERS GOING THROUGH THE WEEKEND ESPECIALLY GIVEN THE EC AND ITS ENSEMBLE SOLUTIONS. TEMPERATURES WILL ALSO REMAIN BELOW NORMAL WITH HIGHS STRUGGLING TO REACH 70 IN WRN NV AND AROUND 60 IN THE SIERRA VALLEYS. WALLMANN
&&

.AVIATION...

SOME SMOKE/HAZE WILL CONTINUE THIS MORNING NEAR THE SIERRA CREST AROUND TAHOE THEN CLEAR SOME AROUND NOON ONLY TO RETURN AROUND 00Z WITH A LIGHT WEST WIND COMING OVER THE CREST AT THAT TIME. SFC VIS COULD REDUCE TO NEAR 2 SM THROUGH 06Z FOR KTRK/KTVL AND ISSUES WITH SLANTWISE VIS ARE ALSO PROBABLE. SMOKE ISSUES ARE LIKELY TO CONTINUE EACH DAY THROUGH AT LEAST WEDNESDAY ASSUMING THE KING FIRE REMAINS ACTIVE.

OTHERWISE, A BAND OF RAIN OVER PERSHING COUNTY WITH POCKETS OF MVFR VIS WILL PERSIST INTO 18Z. THE BAND LOOKS TO REMAIN NORTH OF KRNO THIS MORNING. OTHERWISE, EXPECT MAINLY VFR CONDS THROUGH TONIGHT

WITH ISOLD MVFR CIGS/VIS IN SHRA/TSRA THIS AFTERNOON. SLOW CLEARING
THIS EVENING WITH VFR CONDS OUTSIDE OF SMOKE MONDAY. WALLMANN

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
739 PM PDT SAT SEP 20 2014

.UPDATE...
CONVECTION THIS EVENING IS MAINLY CLUSTERED IN TWO AREAS. THE
CONVECTION ALONG THE CREST AND TO THE WEST IS MORE ASSOCIATED
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OVER THE CENTRAL PART OF NEVADA HAS BEEN MORE CLOSELY ASSOCIATED
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OVER WESTERN NEVADA AND NORTHEAST CALIFORNIA WHERE FORCING IS
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20

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
303 AM PDT SUN SEP 21 2014

.SYNOPSIS...

LOW PRESSURE MOVING ACROSS NEVADA WILL KEEP THE THREAT OF SHOWERS
AND THUNDERSTORMS OVER THE REGION TODAY WITH BELOW NORMAL
TEMPERATURES. HIGH PRESSURE WILL THEN BRING WARMER AND DRIER
CONDITIONS TO THE REGION THROUGH THE MIDDLE OF THE WEEK, THEN
STRONGER LOW PRESSURE BRINGS INCREASING WINDS AND COOLER
TEMPERATURES WITH POSSIBLE RAIN LATER IN THE WEEK.

&&

.SHORT TERM...

SO FAR THE ONLY MEANINGFUL RAINFALL HAS OCCURRED IN EASTERN
CHURCHILL COUNTY WHERE A FEW LOCATIONS RECEIVED UP TO 0.50 INCH,
AND FAR SOUTHERN MONO COUNTY REPORTING AROUND 0.25 INCH. OTHERWISE
RAINFALL HAS BEEN SPARSE WITH RAIN BANDS UNABLE TO HOLD TOGETHER
EXCEPT IN WEST CENTRAL NV.

THE KEY OPPORTUNITY FOR RAIN WRAPPING INTO THE RENO AND TAHOE
VICINITY WILL BE DURING THE MID AND MORNING HOURS BETWEEN 6 AND 11
AM. THIS TIME PERIOD HAD OFTEN BEEN TARGETED FOR THE BEST RAIN
CHANCES, ALTHOUGH THE LATEST NAM AND HRRR GUIDANCE INDICATE A
NARROWER AND WEAKER RAIN BAND COMPARED TO PREVIOUS RUNS. THE
TRADE-OFF OF LESS RAIN AND CLOUD COVERAGE IN THE MORNING COULD BE
INCREASING SHOWER ACTIVITY WITH ISOLATED THUNDERSTORMS IN THE

AFTERNOON, BUT THAT WOULD MAKE RAINFALL MORE HIT OR MISS OVER THE REGION.

THE PRECIP WILL WIND DOWN THIS EVENING AS THE UPPER LOW MOVES TO THE NORTHEAST AND EXITS NORTHEAST NV. DRY CONDITIONS WITH A RETURN TO ABOVE NORMAL HIGH TEMPS IN THE MID-UPPER 80S FOR LOWER ELEVATIONS ARE EXPECTED FOR MONDAY AND TUESDAY, AS RIDGE AXIS MOVES INTO THE GREAT BASIN.

SMOKE FROM THE KING FIRE RETURNED TO TRUCKEE AND PARTS OF THE TAHOE BASIN AFTER 3 PM YESTERDAY, WITH SOME SMOKE PERSISTING EARLY THIS MORNING ESPECIALLY BETWEEN THE NORTH SHORE OF TAHOE TO INTERSTATE 80. ALTHOUGH ADDITIONAL SMOKE IS UNLIKELY TO SPREAD EAST OF THE SIERRA CREST UNTIL LATER IN THE DAY, IT MAY BE DIFFICULT TO FULLY SCOUR OUT THE EXISTING SMOKE ESPECIALLY IF STEADY RAIN MISSES THESE AREAS. FLOW ALOFT BECOMES SOUTHWEST AGAIN MONDAY WITH WEAK ZEPHYR BREEZE RETURNING BY LATE AFTERNOON, AND A SLIGHT INCREASE IN WINDS TUESDAY. THIS COULD BRING MORE SMOKE EAST OF THE SIERRA CREST AND INTO WESTERN NV IF THE KING FIRE IS STILL BURNING ACTIVELY THROUGH HEAVY TIMBER. MJD

.LONG TERM...WEDNESDAY THROUGH SATURDAY...

THE EAST PACIFIC TROUGH AND ITS MOVEMENT WILL CONTINUE TO BE THE FOCUS FOR THE LATTER HALF OF THE WEEK WITH THE MODELS A BIT SLOWER THIS MORNING. THE EC CONTINUES TO BE SLOWER THAN THE GFS WITH THE PROGRESSION BY 24-36 HOURS THIS MORNING. HAVE GENERALLY GONE WITH A BLEND, BUT I AM STARTING TO LEAN MORE TOWARD THE EC. THEIR ENSEMBLES SUPPORT THEIR RESPECTIVE DETERMINISTIC SOLUTIONS, BUT PREFER THE EC ENSEMBLE IDEAS DUE TO THE GREATER NUMBER OF MEMBERS. IT ALSO SHOWS THE GREATEST UNCERTAINTY IS MORE WITH THE DEPTH OF THE TROUGH AND NOT AS MUCH ON SPEED THIS MORNING.

WEDNESDAY CONTINUES TO LOOK A BIT BREEZY BUT NOT AS MUCH SO WITH THE SLOWER TIMING. IT APPEARS THE STRONGEST WINDS WILL OCCUR MORE WEDNESDAY NIGHT INTO THURSDAY BEFORE THE FRONT MOVES THROUGH. THE GFS/EC ARE ONLY ABOUT 12 HOURS DIFFERENT WITH THE FRONT MOVING THROUGH AND CONTINUED THE CHANCE POPS IN THE SIERRA NORTH OF TAHOE INTO NORTHERN WASHOE THU/THU NIGHT WITH SLIGHT CHANCE FARTHER EAST. BEHIND THE FRONT, IT LOOKS MUCH COOLER AND SHOWERY FRIDAY ON BOTH MODELS WITH THE SHOWERS CONTINUING INTO THE WEEKEND PER THE EC. SNOW LEVELS WILL FALL TO NEAR 9000 FEET OR SO BEHIND THE FRONT SO SOME PEAKS MAY SEE A LIGHT CAPPING OF WHITE BY SATURDAY/SUNDAY MORNING. GIVEN THE UNCERTAINTY, KEPT THE THREAT OF SHOWERS GOING THROUGH THE WEEKEND ESPECIALLY GIVEN THE EC AND ITS ENSEMBLE SOLUTIONS. TEMPERATURES WILL ALSO REMAIN BELOW NORMAL WITH HIGHS STRUGGLING TO REACH 70 IN WRN NV AND AROUND 60 IN THE SIERRA VALLEYS. WALLMANN

AREA FORECAST DISCUSSION...UPDATED
NATIONAL WEATHER SERVICE RENO NV
609 AM PDT SUN SEP 21 2014

.UPDATE...

WITH THE MAIN PRECIP BAND BREAKING UP OVER LASSEN/WASHOE/PERSHING COUNTIES, HAVE REDUCED THE POPS FOR THIS MORNING. WITH THE CORE OF THE UPPER LOW MOVING INTO WESTERN NEVADA NOW, SCATTERED SHOWERS WILL CONTINUE TO DEVELOP INTO EARLY AFTERNOON BEFORE SLOWLY WINDING DOWN. THE INSTABILITY IS NOT GREAT OUTSIDE OF THE CORE OF THE LOW SO ONLY ISOLATED THUNDERSTORMS FROM HERE ON OUT SEEM APPROPRIATE. FORECAST MODEL SOUNDINGS ALL SHOW THE GREATEST INSTABILITY BEFORE 18Z AS TEMPS ALOFT WARM AS THE UPPER LOW PULLS AWAY. LEFT TEMPS ALONE DESPITE THE WARM START AS CLOUD COVER IS EXPECTED TO BE ABUNDANT AND LIMIT HEATING. WALLMANN

AREA FORECAST DISCUSSION...UPDATED
NATIONAL WEATHER SERVICE RENO NV
934 AM PDT SUN SEP 21 2014

.UPDATE...

UPDATE THE FORECAST FOR TODAY TO MATCH UP WITH THE LATEST TRENDS. BAND OF RAIN REMAINS NORTH OF RENO-TRUCKEE THIS MORNING. GOOD RAINFALL AMOUNTS ARE OCCURRING THERE, BUT THE TRACK OF THE LOW WILL LIKELY KEEP THE RAIN BAND NORTH OF THE RENO-TAHOE AREA THIS MORNING.

WE STILL EXPECT SHOWERS TO DEVELOP THIS AFTERNOON OVER THE RENO-TAHOE AREA AS COLD AIR ALOFT KEEPS THE ATMOSPHERE UNSTABLE. CANNOT TOTALLY RULE OUT THE CHANCE OF THUNDERSTORMS, SO KEPT IN A MENTION OF SLIGHT CHANCE. BUT, THE MAIN MODE OF PRECIPITATION EXPECTED TODAY IS RAIN SHOWERS.

AS FOR AIR QUALITY, DENSE SMOKE SETTLED INTO THE TRUCKEE AREA OVERNIGHT WITH VERY POOR AIR QUALITY THIS MORNING. AIR QUALITY MAY INCREASE SLIGHTLY AS THE ATMOSPHERE BECOMES MIXED, BUT WEST WINDS THIS AFTERNOON WILL ONLY BRING IN ADDITIONAL SMOKE TO THE TAHOE BASIN. SMOKE CONDITIONS WILL ONLY DETERIORATE FOR TAHOE AND WESTERN NEVADA OVER THE NEXT FEW DAYS AS SOUTHWEST FLOW RETURNS, BRINGING SMOKE FROM THE KING FIRE. HOON

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
306 PM PDT SUN SEP 21 2014

.SYNOPSIS...

SOUTHWEST FLOW AND BUILDING HIGH PRESSURE WILL THEN BRING WARMER AND DRIER CONDITIONS TO THE REGION THROUGH THE MIDDLE OF THE WEEK, ALONG WITH SMOKE TO THE REGION FROM THE ONGOING KING FIRE. STRONGER LOW PRESSURE BRINGS INCREASING WINDS AND COOLER TEMPERATURES WITH POSSIBLE RAIN LATER IN THE WEEK.

&&

.SHORT TERM...

LIGHT RAINFALL TODAY THROUGH THE SIERRA AND UP THROUGH FAR NORTHWEST NEVADA AS THE LOW PRESSURE PIVOTED THROUGH THE AREA. THE AREA THAT RECEIVED THE HIGHEST RAINFALL WAS IN EASTERN PERSHING AND CHURCHILL COUNTIES LAST NIGHT WHERE UP TO 0.50" FELL. OTHERWISE, ONLY LIGHT RAIN WAS REPORTED FOR OTHER AREAS.

A FEW ISOLATED SHOWERS AND THUNDERSTORMS HAVE DEVELOPED IN WESTERN NEVADA THIS AFTERNOON. ONE SHOWER THAT MOVED INTO FERNLEY EARLIER PRODUCED BRIEF, BUT HEAVY RAINFALL IN THE AREA. THIS GOES TO SHOW

THAT THE MOISTURE CONTENT IN THE AIR IS VERY HIGH, WITH EFFICIENT PRECIPITATION. ISOLATED TO SCATTERED SHOWERS WILL CONTINUE THROUGH THE EVENING HOURS, THEN TAPER OFF AS LOW PRESSURE MOVES OUT OF THE REGION.

ABUNDANT CLOUD COVER HAS REMAINED OVER THE REGION ALL DAY, KEEPING TEMPERATURES A BIT COOLER AND KEEPING THE AIR FROM MIXING. THIS WAS A BIG FACTOR IN THE SMOKE IN THE TRUCKEE AREA NOT BEING ABLE TO MIX OUT DUE TO THE LACK OF HEATING. WINDS AT RIDGE LEVEL HOWEVER ARE SHIFTING TO THE SOUTHWEST AND WILL BRING ADDITIONAL SMOKE INTO TAHOE BASIN AND RENO-CARSON-MINDEN AREAS AS WELL. A DENSE SMOKE ADVISORY HAS BEEN ISSUED THROUGH MONDAY AFTERNOON IN ANTICIPATION THAT SMOKE WILL BECOME WORSE OVER THE NEXT 24 HOURS. SMOKE DENSITY WILL ALSO

DEPEND HIGHLY ON FIRE ACTIVITY OVER THE NEXT FEW DAYS, SO THE DENSE SMOKE ADVISORY WILL NEED TO BE REEVALUATED EACH AFTERNOON. BUT, WITH THE SOUTHWEST FLOW EXPECTED TO CONTINUE, SMOKE WILL REMAIN IN THE FORECAST THROUGH AT LEAST WEDNESDAY.

DRY AND WARM CONDITIONS WILL RETURN TO THE REGION MONDAY AND TUESDAY AS HIGH PRESSURE BUILDS OVER THE REGION AND SOUTHWEST FLOW RETURNS ALOFT. EXPECT TEMPERATURES TO INCREASE TO ABOVE NORMAL AGAIN WITH MID TO UPPER 80S IN WESTERN NEVADA AND 70S IN THE SIERRA. HOON

.LONG TERM...WEDNESDAY THROUGH SUNDAY...

A TROUGH OVER THE EAST PACIFIC WILL PROVIDE BREEZY SOUTHWEST WINDS BY MIDWEEK AHEAD OF A COLD FRONT WHICH WILL PROVIDE COOLER CONDITIONS AND CHANCES FOR SHOWERS THE SECOND HALF OF THE WEEK. THE FORECAST CONFIDENCE IN THE EXTENDED IS GOOD FOR WEDNESDAY AND THURSDAY BEFORE DEGRADING SIGNIFICANTLY OVERNIGHT THURSDAY INTO FRIDAY DUE TO LARGE DISCREPANCIES IN TIMING THE EJECTION OF THE UPPER LOW.

FOR WED-THU, AXIS OF THE UPPER TROUGH WILL REMAIN JUST OFF THE WEST COAST WITH GUSTY WINDS MAINLY CONCENTRATED NORTH OF INTERSTATE 80 AS THE UPPER LEVEL JET BEGINS TO DROP ACROSS NE CALIFORNIA. STRONGER WINDS LOOK TO BECOME MORE WIDESPREAD BY THURSDAY AHEAD OF A FRONT AS THE SURFACE PRESSURE GRADIENT INTENSIFIES AND THE CORE OF 105+ KT JET CROSSES THE SIERRA. SUSTAINED SW-W WINDS IN THE 15-25 MPH RANGE ARE POSSIBLE THURSDAY BEFORE SHIFTING NORTHWEST BEHIND THE FRONT WITH MODELS PUSHING THE FRONT THROUGH OVERNIGHT THURSDAY INTO EARLY FRIDAY.

COOLER CONDITIONS ARE EXPECTED BEHIND THE FRONT WITH POSSIBLE HIGH TEMPERATURES ACROSS WESTERN NEVADA ONLY IN THE UPPER 60S TO LOWER 70S AND LOWER 60S ACROSS SIERRA VALLEYS. CONSIDERABLE UNCERTAINTY

EXISTS WITH HOW QUICKLY THE LOW DEPARTS WITH THE GFS BEING MUCH
QUICKER THAN THE EC WHICH LINGERS THE LOW OVER THE REGION THROUGH
NEXT WEEKEND. THE EC WOULD PROVIDE US WITH A COOLER AND WETTER
FORECAST THAN THE WARMER AND DRIER SOLUTION OF THE GFS. LITTLE
CHANGE MADE IN THE FORECAST FOR NEXT WEEKEND AS TRENDS AND ENSEMBLE
RUNS OFFER LITTLE CONFIDENCE TO MAKE MANY ADJUSTMENTS. WILL MAINTAIN
SLIGHT CHANCES FOR SHOWERS AND A SLOWER WARMUP IN THE FORECAST
BEYOND FRIDAY. FUENTES

AREA FORECAST DISCUSSION...UPDATED
NATIONAL WEATHER SERVICE RENO NV
802 PM PDT SUN SEP 21 2014

.UPDATE...

SATELLITE IMAGERY SHOWS UPPER LOW OVER WEST CENTRAL NV LIFTING NE
TOWARD THE NORTH CENTRAL PART OF THE STATE. THIS IS IN LINE WITH
CURRENT MODEL GUIDANCE. CONVECTION OVER THE FAR EASTERN PARTS OF

THE CWA IS DISSIPATING...BUT THIS CONVECTION DID PRODUCE SOME
HEAVIER RAINS OVER ISOLATED AREAS TODAY RESULTING IN TWO REPORTS
OF WATER AND DEBRIS OVER STATE HIGHWAYS IN SOUTHEAST CHURCHILL
COUNTY. THE HRRR STILL SHOWS CONVECTION DEVELOPING OVER THE FAR
NRN CWA LATER THIS EVENING ASSOCIATED WITH A WEAK VORTICITY LOBE
ROTATING AROUND THE UPPER LOW AND A LITTLE LINGERING CONVECTION
OVER THE FAR EASTERN CWA. WITH THIS IN MIND HAVE DECREASED POPS
FOR THE FAR WEST AND SOUTH BUT LEFT SOME SMALL POPS IN OVER THE
FAR NORTH AND EAST THROUGH LATE EVENING. AS UPPER LOW EXITS LATE
TONIGHT DRIER CONDITIONS SHOULD RETURN FOR MONDAY.

ATTENTION TURNS TO THE SMOKE FROM THE KING FIRE THAT HAS MOVED
BACK INTO THE WESTERN PART OF NEVADA AND NORTHEAST CALIFORNIA. THE
SMOKE WAS A LITTLE THICKER LATE THIS AFTERNOON. THE THINNING OF

THE SMOKE IS LIKELY A RESPONSE TO LESS FIRE ACTIVITY AND LIGHTER WINDS THIS EVENING. SMOKE FORECASTING CAN BE SOMEWHAT DIFFICULT AS IT RELIES LARGELY ON THE INTENSITY OF THE FIRE. EVEN THOUGH THE SMOKE HAS THINNED WE COULD SEE A RESURGENCE LATE TONIGHT AS THE ATMOSPHERE BECOMES MORE STABLE...OR IT COULD THIN MORE. WILL LEAVE THE DENSE SMOKE ADVISORY IN PLACE AS WINDS MONDAY SHOULD BECOME MORE WESTERLY THROUGH THE DAY AND DRIVE ANY SMOKE GENERATED BACK THIS DIRECTION. IT IS POSSIBLE THAT STRONGER WINDS LATER IN THE WEEK WILL RESULT IN EVEN MORE SMOKE IN THE TAHOE BASIN AND WRN NEVADA...BUT THIS REMAINS A BIT UNCERTAIN AT THIS TIME. 20

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
259 AM PDT MON SEP 22 2014

.SYNOPSIS...

SOUTHWEST FLOW AND BUILDING HIGH PRESSURE WILL BRING WARM AND DRY CONDITIONS TO THE REGION THROUGH THE MIDDLE OF THE WEEK, ALONG WITH SMOKE AND HAZE FROM THE KING FIRE. STRONGER LOW PRESSURE MOVING SLOWLY TOWARD THE WEST COAST WILL BRING INCREASING WINDS AND COOLER TEMPERATURES WITH POSSIBLE RAIN LATER IN THE WEEK.

&&

.SHORT TERM...

WITH VISIBILITIES GENERALLY 5 MILES OR GREATER ACROSS THE SMOKE ADVISORY AREA, WE WILL ADJUST THE VALID TIMES TO EXCLUDE MOST OF THE MORNING FOR THE TAHOE BASIN, AND EXCLUDE THE MORNING AND EARLY AFTERNOON FOR THE RENO-CARSON VICINITY. VISIBILITY IS UNLIKELY TO DROP OFF VERY MUCH THIS MORNING FROM SMOKE ALONE. THE ONLY EXCEPTION MAY BE AROUND TRUCKEE WHERE FOG COULD BE MORE RESPONSIBLE

FOR POOR VISIBILITY THIS MORNING. AS WEST-SOUTHWEST FLOW ALOFT RETURNS TO THE SIERRA TODAY, ADDITIONAL SMOKE COULD RETURN BY LATE MORNING IN THE TAHOE BASIN. FOR THE RENO-CARSON CITY AREA, THE WEAK AFTERNOON ZEPHYR IS MOST LIKELY TO TRANSPORT ADDITIONAL SMOKE BY MID AFTERNOON. WHILE THE VISIBILITY MAY NOT DROP ALL THE WAY DOWN TO 1 MILE, WE DID NOT WANT TO REMOVE THE SMOKE ADVISORY SINCE THE KING FIRE COULD BECOME MORE ACTIVE DUE TO DRIER AND WARMER CONDITIONS AND INCREASING SOUTHWEST WINDS WEST OF THE SIERRA CREST.

HAZE AND SMOKE WILL REMAIN IN THE FORECAST THRU WEDNESDAY AS THE KING FIRE WILL PROBABLY CONTINUE TO BURN ACTIVELY. PREVAILING SOUTHWEST FLOW ALOFT IS EXPECTED TO BECOME STRONGER, WHILE ZEPHYR BREEZES INCREASE FOR WESTERN NV EACH DAY WITH AFTERNOON GUSTS UP TO 30 MPH POSSIBLE WEDNESDAY.

OTHER THAN THE SMOKE AND HAZE, DRY CONDITIONS WILL PREVAIL OVER THE REGION THRU MIDWEEK. DAYTIME TEMPS WILL BE SEVERAL DEGREES ABOVE NORMAL, MAINLY IN THE MID TO UPPER 80S FOR WESTERN NV AND 75-80 DEGREES FOR THE SIERRA VALLEYS. A FEW LIGHT RAIN SHOWERS MAY REACH NORTHEAST CA BY LATE WED NIGHT WITH THE NEXT TROUGH SLOWLY APPROACHING THE WEST COAST, BUT CONFIDENCE IS NOT VERY HIGH THAT SIGNIFICANT MOISTURE WILL ARRIVE BY THAT TIME. MJD

.LONG TERM...THURSDAY THROUGH SUNDAY...

FEW CHANGES MADE TO THE LONG TERM AS THE GFS/EC CONTINUE TO DIFFER ON THE SPEED OF THE TROUGH/UPPER LOW MOVING THROUGH LATE WEEK AND OVER THE WEEKEND. THE GFS CONTINUES TO BE FASTER ALTHOUGH IT IS SLOWING ONCE THE LOW MOVES INTO UTAH. THE EC IS EVEN SLOWER THIS MORNING NOT MOVING OUT THE UPPER LOW UNTIL LATE SUNDAY. THE EC SEEMS OVERLY SLOW NOW AND ITS ENSEMBLE IS A BIT FASTER AND SHOWING SOME UNCERTAINTY WITH A POTENTIAL FASTER SPEED.

THAT SAID, THE COLD FRONT WILL MOVE THROUGH SOMETIME THURSDAY (GFS)
OR FRIDAY (EC). TEMPS WILL REMAIN MILD AHEAD WITH BREEZY CONDITIONS
AT LEAST THURSDAY. THE BEST CHANCE OF PRECIP ALONG THE FRONT WILL
REMAIN OVER NORTHEAST CALIFORNIA. BEHIND THE FRONT, ISOLATED TO
SCATTERED SHOWERS ARE POSSIBLE INTO THE WEEKEND. SATURDAY APPEARS TO
BE THE BEST DAY FOR ANY SIGNIFICANT PRECIP AS THE EC CONTINUES TO
SHOW SOME MODERATE PRECIP IN THE DEFORMATION BAND NORTH OF THE LOW
FOR AREAS NORTH OF I-80. EXPECT SNOW LEVELS TO FALL TO 8000-9000
FEET BEHIND THE FRONT SO SOME PEAKS MAY SEE A LIGHT CAPPING OF
SNOW.

BEHIND THE FRONT, EXPECT WIND TO WEAKEN A BIT AS SFC PRESSURE/THERMAL
GRADIENTS AND WINDS ALOFT WEAKEN. TEMPS WILL ALSO COOL DOWN WITH
HIGHS AROUND 70 IN WESTERN NV AND LOW 60S FOR THE SIERRA VALLEYS,
WHICH IS ABOUT 10 DEGREES BELOW AVERAGE. WALLMANN

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
834 AM PDT MON SEP 22 2014

.UPDATE...
A FIRE WEATHER WATCH HAS BEEN ISSUED FOR PORTIONS OF NORTHEASTERN
CALIFORNIA AND FAR NORTHWEST NEVADA FOR GUSTY WINDS AND LOW
HUMIDITY. FORECASTER CONFIDENCE IS INCREASING FOR SOUTHWEST WINDS
TO INCREASE WITH GUSTS UP TO 40 MPH POSSIBLE FOR THOSE AREAS. A
DRY SLOT PUSHING IN EARLY WEDNESDAY WILL ALLOW RELATIVE HUMIDITY
VALUES TO DECREASE BELOW THRESHOLDS ALLOWING FOR THESE CRITICAL

FIRE CONDITIONS TO DEVELOP. WEISHAHN

AREA FORECAST DISCUSSION

NATIONAL WEATHER SERVICE RENO NV
250 PM PDT MON SEP 22 2014

.SYNOPSIS...
HIGH PRESSURE WITH INCREASING SOUTHWEST FLOW WILL BRING WARM AND DRY CONDITIONS TO THE REGION THROUGH THE MIDDLE OF THE WEEK. SMOKE AND HAZE FROM THE KING FIRE WILL CONTINUE TO AFFECT WESTERN NEVADA AND NORTHEAST CALIFORNIA. A LOW PRESSURE SYSTEM APPROACHING THE WEST COAST WILL BRING INCREASING WINDS AND COOLER TEMPERATURES WITH POSSIBLE RAIN LATER IN THE WEEK.
&&

.SHORT TERM...
MAIN CONCERNS IN THE SHORT TERM WILL BE THE CONTINUED SMOKE/HAZE FROM THE KING FIRE AS WELL AS GUSTY WINDS AS A LOW PRESSURE SYSTEM APPROACHES THE WEST COAST.

VISIBILITY AND AIR QUALITY CONTINUE TO BE IMPACTED BY THE SMOKE FROM THE KING FIRE THIS AFTERNOON. WITH WEST/SOUTHWEST FLOW ACROSS THE REGION AND AS LONG AS THE FIRE BURNS ACTIVELY, WE DO NOT ANTICIPATE IMPROVING CONDITIONS WITH THE SMOKE AND HAZE ACROSS THE TAHOE BASIN AND WESTERN NEVADA THROUGH WEDNESDAY. DENSE SMOKE ADVISORIES REMAIN IN EFFECT FOR THIS AFTERNOON AND EVENING AND WE HAVE ALSO ISSUED ANOTHER ROUND OF DENSE SMOKE ADVISORIES FOR TUESDAY. ALTHOUGH VISIBILITIES WILL REMAIN GENERALLY ABOVE 5 MILES, THERE WILL BE LOCALIZED CONDITIONS AND VISIBILITY DOWN TO 1 MILE AT TIMES THROUGH THE AFTERNOONS/EVENINGS FOR THE NEXT COUPLE OF DAYS.

UPPER LEVEL SOUTHWEST FLOW WILL INCREASE TUESDAY AND WEDNESDAY AS THE NEXT LOW PRESSURE SYSTEM APPROACHES THE WEST COAST. GUSTY SOUTHWEST WINDS AROUND 35 MPH ALONG WITH DRY CONDITIONS WILL IMPACT THE REGION ON WEDNESDAY INTO THURSDAY, WITH FIRE WEATHER IMPACTS

POSSIBLE. READ THE FIRE WEATHER DISCUSSION BELOW FOR DETAILS ON
WINDS AND LOW HUMIDITY.

OTHERWISE, DRY CONDITIONS WILL CONTINUE OVER THE REGION THRU
MIDWEEK. HIGH TEMPERATURES WILL BE SEVERAL DEGREES ABOVE NORMAL,
MAINLY IN THE MID TO UPPER 80S FOR WESTERN NEVADA AND MID 70S FOR THE
SIERRA VALLEYS. SLIGHT CHANCES FOR RAIN SHOWERS WILL BE POSSIBLE FOR
FAR NORTHEASTERN CALIFORNIA BY EARLY THURSDAY AHEAD OF THE NEXT
LOW PRESSURE SYSTEM. ELW

.LONG TERM...THURSDAY THROUGH MONDAY...
LARGE UPPER LEVEL TROUGH WILL BE POSITIONED OFF THE WEST COAST BY
THURSDAY WITH A 110KT JET CROSSING OVER NORTHERN CALIFORNIA. THIS
SYSTEM WILL PROVIDE WINDY CONDITIONS THURSDAY AS A STRENGTHENED
SURFACE PRESSURE GRADIENT AND MIXING OF 35-40 KTS WINDS ALOFT
DEVELOPS AHEAD OF A SURFACE COLD FRONT PASSAGE LATE IN THE DAY
THURSDAY INTO EARLY FRIDAY MORNING. MOISTURE WILL INCREASE WITH THE
TROUGH SO EXPECTING INCREASES IN SURFACE HUMIDITY WHICH SHOULD HELP
MITIGATE FIRE WEATHER CONCERNS AT THIS TIME. WIND GUSTS AROUND 40-45
MPH ARE POSSIBLE WHICH MAY CREATE HAZARDOUS BOATING CONDITIONS AND
MAY IMPACT MOTORISTS IN HIGH PROFILE VEHICLES. SCATTERED SHOWERS ARE
ALSO POSSIBLE THURSDAY WITH THE BEST CHANCES ALONG THE SIERRA AND
WITH THE FRONT INTO WESTERN NEVADA MAINLY NORTH OF HWY 50.

BEHIND THE FRONT COOLER CONDITIONS WILL PREVAIL WITH HIGH
TEMPERATURES ACROSS WESTERN NEVADA ONLY REACHING THE UPPER 60S TO
LOW 70S AND LOWER 60S ACROSS SIERRA VALLEYS. TIMING DIFFERENCES STILL
EXIST BETWEEN THE EC AND GFS REGARDING HOW FAST THE UPPER LOW
DEPARTS THE REGION WITH THE GFS MAINTAINING A FASTER DEPARTURE.
LITTLE CHANGE IN THE FORECAST BEYOND FRIDAY BUT STILL EXPECTING A
PERIOD OF SHOWERS TO PERSIST AS THE COOLER TEMPS ALOFT PROMOTE
INCREASED INSTABILITY. WHETHER THE BEST POTENTIAL FOR PRECIP EXISTS
FRIDAY OR SATURDAY WILL NEED TO BE FURTHER REFINED BUT SEEMS THE GFS

HAS TRENDED MORE TOWARDS THE EC WITH A SLOWER DEPARTURE. SOME
PRECIP COULD OCCUR IN THE FORM OF SNOWFALL FOR AREAS ABOVE
8000-9000 FEET WITH 700MB TEMPS COOLING AS MUCH AS -2C. BEYOND
SATURDAY, MOST MODELS EJECT THE LOW AND WE SHOULD BEGIN A GRADUAL
WARMING AND DRYING PATTERN INTO THE START OF NEXT WEEK. FUENTES

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
544 PM PDT MON SEP 22 2014

.UPDATE...
JUST DOING A QUICK UPDATE TO COVER SHOWERS OVER THE FAR NORTHERN
PART OF THE FORECAST AREA. ISOLATED SHOWERS ARE OCCURRING NORTH OF
GERLACH AND THIS APPEARS TO BE IN RESPONSE TO A WEAK WAVE PUSHING
THROUGH THAT AREA. THIS IS WELL AHEAD OF THE MAIN TROUGH
DEVELOPING OVER THE ERN PAC AND COULD BE MORE OF A WEAK WARM AIR
ADVECTION SIGNATURE MOVING OVER THE TOP OF THE RIDGE IN PLACE OVER

THE SRN CWA. WILL ONLY MENTION SHOWERS THIS EVENING FOR THAT AREA
AS FORCING APPEARS TO ABATE LATER THIS EVENING.

SMOKE IS RETURNING TO WRN NV NOW AFTER STAYING MAINLY IN THE
TRUCKEE AREA MOST OF THE AFTERNOON. WESTERLY WINDS ARE DRIVING
THIS SMOKE IN THE VALLEYS AND IT WILL LIKELY STAY TRAPPED HERE FOR
SOME TIME THIS EVENING. CURRENTLY THE DENSE SMOKE ADVISORY IN
EFFECT NOW RUNS UNTIL 8 PM...BUT WE WILL NEED TO LOOK AT THAT AND
MAY EXTEND IT INTO THE LATE NIGHT HOURS. TYPICALLY THE SMOKE HAS
BEEN DISSIPATED LATE IN THE EVENING AS WINDS BEGIN TO DROP OFF. 20

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
816 PM PDT MON SEP 22 2014

.UPDATE...
SMOKE HAS STARTED TO THIN A BIT ACROSS THE AREA TONIGHT. THIS MAY BE THE RESULT OF LESS WIND TRANSPORTING SMOKE INTO THE REGION OR LESS FIRE ACTIVITY OR A COMBINATION OF THE TWO. WITH THE DECREASE IN SMOKE INTENSITY WE HAVE ALLOWED THE DENSE SMOKE ADVISORY THAT WAS IN EFFECT THIS EVENING TO EXPIRE. THERE REMAINS A DENSE SMOKE ADVISORY FOR TOMORROW AS WINDS ARE LIKELY TO INCREASE AND PUSH THICKER SMOKE BACK INTO THE REGION.

THE SHOWERS AND THUNDERSTORMS THAT DEVELOPED ACROSS THE SURPRISE VALLEY AND FAR NORTHERN WASHOE COUNTY EARLIER HAVE DISSIPATED AS THE TROUGH THIS CONVECTION WAS ASSOCIATED WITH HAS PUSHED TO THE EAST. IT IS NOT OUT OF THE QUESTION FOR ADDITIONAL ISOLATED SHOWERS TO FORM LATER TONIGHT AS ANOTHER TROUGH MOVES THROUGH. FOR NOW WILL LEAVE THIS OUT OF THE FORECAST AS FORCING DOES NOT APPEAR AS GOOD WITH THIS TROUGH. 20

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
232 AM PDT TUE SEP 23 2014

.SYNOPSIS...
DEVELOPING LOW PRESSURE IN THE PACIFIC WILL BRING INCREASING SOUTHWEST FLOW AND CONTINUED WARM AND DRY CONDITIONS THROUGH WEDNESDAY. SMOKE FROM THE KING FIRE WILL CONTINUE TO AFFECT THE TAHOE BASIN AND WESTERN NEVADA. THE LOW PRESSURE SYSTEM WILL MOVE INLAND ON THURSDAY WITH COOLER TEMPERATURES AND POSSIBLE SHOWERS FOR THE END OF THE WEEK.

&&

.SHORT TERM...

THERE IS REASONABLE AGREEMENT IN THE OPERATIONAL SUITE OF MODELS THIS MORNING WITH REGARD TO INCOMING TROUGH AND COLD FRONT. THE PATTERN IS FORECAST TO BEGIN AMPLIFYING WITH TROUGH LOCATED NEAR 130W BY WEDNESDAY AFTERNOON AND RIDGE SITUATED OVER THE CENTRAL AND SOUTHERN ROCKIES. THIS WILL PLACE OUR AREA IN A GENERAL SOUTHWEST FLOW ALOFT WITH TEMPERATURES REMAINING WELL ABOVE NORMAL. THE MAIN JET WILL STILL BE WEST OF THE AREA BUT WINDS WILL INCREASE A LITTLE EACH DAY AS WINDS ALOFT INCREASE AHEAD OF TROUGH. WINDS COULD GUST AS HIGH AS 35 MPH MAINLY ACROSS NORTHEAST CA AND NORTHWEST NV WEDNESDAY AFTERNOON WITH LOCAL GUSTS AROUND 30 MPH IN THE TAHOE BASIN AND SIERRA FRONT. SMOKE WILL CONTINUE TO BE AN ISSUE AROUND THE TAHOE BASIN AND INTO WESTERN NEVADA AS AFTERNOON ZEPHYR WINDS (TURNING MORE WESTERLY) OCCUR EACH AFTERNOON AND EARLY EVENING. DEPENDING ON THE ACTIVITY OF THE FIRE, SMOKE WILL RESULT IN LOWERING VISIBILITY AND DIMINISHING AIR QUALITY FOR A TIME, BEGINNING IN THE TAHOE BASIN THIS MORNING OR EARLY AFTERNOON AND THEN SPREADING INTO WESTERN NV DURING THE MID TO LATE AFTERNOON. A DRIER AIRMASS WILL BE IN PLACE TODAY THROUGH WEDNESDAY WHICH INCREASES THE POTENTIAL FOR INCREASED FIRE AND SMOKE. THE DENSE SMOKE ADVISORY WILL REMAIN IN PLACE FOR TODAY BUT MAY NEED TO BE EXTENDED INTO WEDNESDAY.

AS THE TROUGH APPROACHES THE COAST WEDNESDAY NIGHT AND THURSDAY, THE UPPER JET WILL DROP SOUTHEASTWARD INTO NORTHERN CA AND NORTHWEST NV WITH FRONTAL BOUNDARY PUSHING INTO NORTHEAST CA WEDNESDAY NIGHT AND INTO WESTERN NV THURSDAY. A BAND OF SHOWERS WILL LIKELY ACCOMPANY THE FRONT AS IT MOVES INTO THE NORTHERN SIERRA LATE WEDNESDAY NIGHT AND THURSDAY MORNING AND THEN INTO NORTHWEST NV DURING THE DAY THURSDAY. INSTABILITY IS MARGINAL AS TEMPERATURES ALOFT REMAIN WARM (MAIN COLD POOL WITH UPPER LOW WILL STILL BE LOCATED OFFSHORE). HOWEVER FORCING ALONG FRONT AND UPPER JET MAY BE ENOUGH TO PRODUCE SOME LIGHT QPF AMOUNTS. ALL MODELS INDICATE A FEW LIGHT SHOWERS MAY MAKE IT AS FAR SOUTH AS HIGHWAY

50 BY THURSDAY AFTERNOON. HOWEVER, THEY INDICATE BAND WILL FALL
APART QUICKLY AS MOISTURE BECOMES MORE LIMITED.

THE THERMAL GRADIENT WILL BE QUITE STRONG THURSDAY WITH WINDS
LIKELY PICKING UP OVER THE TAHOE BASIN AND SIERRA FRONT EARLY
THURSDAY AND SPREADING ACROSS MUCH OF THE AREA DURING THE
AFTERNOON. WINDS WILL LIKELY GUST TO AROUND 40 MPH WITH SIERRA
RIDGE GUSTS UP TO 80 MPH. WE HAVE NOT INCLUDED SMOKE BEYOND
WEDNESDAY, BUT GIVEN THE WESTERLY WIND DIRECTION ON THURSDAY, IF
THE FIRE CONTINUES TO BE ACTIVE, SMOKY CONDITIONS WOULD PERSIST
ANOTHER DAY. HOHMANN

.LONG TERM...FRIDAY THROUGH MONDAY...
FEW CHANGES MADE TO THE LONG TERM AS THE MODELS ARE COMING INTO
BETTER AGREEMENT ON THE TIMING OF THE UPPER LOW MOVING THROUGH THIS
WEEKEND. HOWEVER, THERE ARE SIGNIFICANT DIFFERENCES IN THE DETAILS
AND WHERE AN AREA OF DEFORMATION NORTH/NORTHEAST OF THE LOW MAY
DEVELOP. FOR NOW, ASIDE FROM A BAND OF PRECIP THAT ALL MODELS ARE
SHOWING ALONG THE SIERRA FRIDAY AFTERNOON/EVENING, IT IS DIFFICULT
TO FAVOR ONE AREA OVER ANOTHER. AS SUCH, WILL JUST KEEP CHANCE POPS
IN THE SIERRA FROM TAHOE NORTH FRIDAY AND A BROAD BRUSH SLIGHT
CHANCE OF PRECIP THROUGH THE WEEKEND. MOST MODELS ARE KEEPING THE
AREA OF DEFORMATION OVER EASTERN/NORTHEASTERN NEVADA SO REALLY DO
NOT FEEL LIKE GOING HIGHER THAN SLIGHT CHANCE.

THE COLD FRONT SHOULD BE CLEARING WESTERN NEVADA BY FRIDAY MORNING.
THEREFORE, WINDS WILL DIMINISH AND BECOME MORE NORTHWEST ALONG WITH
MUCH COOLER TEMPERATURES THAT WILL LAST THROUGH THE WEEKEND WITH THE
UPPER LOW OVERHEAD OR NEARBY. EXPECT TEMPS TO HOVER AROUND 70 IN
WESTERN NV VALLEYS AND IN THE LOW 60S IN THE SIERRA AND A LIGHT
NORTH BREEZE WILL MAKE IT FEEL A LITTLE COOLER. AS THE UPPER LOW
BEGINS TO PULL AWAY ON MONDAY, A SLOW WARMING TREND WILL COMMENCE
WITH HIGHS CLOSER TO AVERAGE. WALLMANN

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
253 PM PDT TUE SEP 23 2014

.SYNOPSIS...

DEVELOPING LOW PRESSURE IN THE PACIFIC WILL BRING INCREASING SOUTHWEST FLOW AND CONTINUED WARM AND DRY CONDITIONS THROUGH WEDNESDAY. SMOKE FROM THE KING FIRE WILL CONTINUE TO AFFECT THE TAHOE BASIN AND WESTERN NEVADA UNTIL FIRE ACTIVITY DIMINISHES. THE LOW PRESSURE SYSTEM WILL MOVE INLAND ON THURSDAY WITH COOLER TEMPERATURES AND POSSIBLE SHOWERS FOR THE END OF THE WEEK.

&&

.SHORT TERM...

NO MAJOR ADJUSTMENTS WERE NECESSARY TO THE EXISTING FORECAST. ONLY SLIGHT CHANGES WERE MADE TO REFLECT MOST CURRENT OBSERVATIONS AND MODEL TRENDS. THE MAIN CONCERNS FOR THIS FORECAST CONTINUE TO BE SMOKE AND HAZE DUE TO THE KING FIRE AND CRITICAL CONDITIONS FOR FIRE WEATHER AS SOUTHWESTERLY FLOW INCREASES WHILE A DRY SLOT PRECEDES THE APPROACHING LOW.

SMOKE WILL CONTINUE TO IMPACT THE REGION WHILE FLOW REMAINS SOUTHWESTERLY. THIS WILL DRIVE POOR AIR QUALITY THAT HAS PLAGUED THE SIERRA FROM THE TAHOE BASIN NORTHWARD AND THE RENO METRO AREA. THE ONLY THING THAT WILL DISRUPT THIS PATTERN WILL BE WHEN THE LOW MOVES OVER THE SIERRA AND NEVADA LATER THIS WEEK. SOME RELIEF MAY COME FROM RAIN AS PRECIPITATION KNOCKS FINER PARTICULATES OUT OF THE AIR. WE HAVE DECIDED TO EXTEND THE DENSE SMOKE ADVISORY BASED

ON AIR QUALITY IMPACTS THROUGH 11 PM WEDNESDAY EVENING. THIS IS DUE MORE TO CONDITIONS BEING WORST IN THE LATE AFTERNOON AS NEW SMOKE PUSHES ACROSS AND TERRIBLE AIR QUALITY IN THE MORNING AS SMOKE SETTLES IN AREA VALLEYS.

MODELS CONTINUE TO BE FAIRLY CONSISTENT FROM ONE RUN TO ANOTHER, AND SOLUTIONS ARE SIMILAR BETWEEN GRIDDED AND GLOBAL DETERMINISTIC RUNS. WHILE THEY ALL DIFFER ON SUBTLE TIMING OF MAJOR FEATURES, THE OVERALL STORY IS THE SAME. LOW PRESSURE DROPS OUT OF THE GULF OF ALASKA DOWN THE PACIFIC COAST WITH A RELATIVELY STRONG ASSOCIATED UPPER LEVEL TROUGH TODAY THROUGH THURSDAY. SOUTHWEST WINDS RESPOND BY INCREASING EACH DAY AS THE PRESSURE GRADIENT TIGHTENS AHEAD OF THE TROUGH STARTING THIS AFTERNOON. GENERALLY, GUSTS WILL BE UP TO 25 MPH TODAY, UP TO 35 MPH TOMORROW, AND UP

TO 40 MPH BY THURSDAY. ALSO, A DRY SLOT PRECEDES THE MAIN CORRIDOR OF PRECIPITATION AND WILL REMAIN IN PLACE THROUGH WEDNESDAY EVENING. FOR MORE SPECIFICS ON WINDS AND HOW THIS WILL IMPACT FIRE WEATHER, SEE THE FIRE WEATHER DISCUSSION BELOW.

PRECIPITATION LAGS UNTIL LATE WEDNESDAY NIGHT SLOWLY MOVING THROUGH THE SIERRA BEFORE SPREADING INTO WESTERN NEVADA ON THURSDAY. AS IS TYPICAL OF THIS FORECAST AREA, THERE WILL BE QUITE A BIT OF PRECIPITATION SHADOWING TO THE LEE OF THE SIERRA. ALSO, ENERGY EXITS THE TROUGH BEFORE ANY MEANINGFUL PRECIPITATION CAN FALL LOWERING CHANCES AND LIMITING TOTALS. THEREFORE, SIERRA LOCATIONS CAN GENERALLY EXPECT TOTALS LESS THAN 0.15" WITH THE SHADOWED LOCATIONS RECEIVING LESS THAN 0.05". PRECIPITATION SHOULD FALL AS RAIN SINCE COLDER AIR WILL BE MORE ASSOCIATED WITH THE CORE OF THE UPPER LOW RATHER THAN THE FRONT EDGE OF THE TROUGH. STILL, A FEW FLURRIES WILL BE POSSIBLE FOR THE HIGHEST ELEVATIONS GENERALLY ABOVE 8500 FEET. BOYD

.LONG TERM...FRIDAY THROUGH TUESDAY...
ONLY SMALL ADJUSTMENTS TO THE LONG TERM FORECAST, MAINLY TO KNOCK TEMPERATURES DOWN TO AROUND FREEZING IN SOME TYPICALLY COLDER LOWER VALLEYS FOR MONDAY MORNING.

AN UPPER LOW WILL MOVE INTO THE WEST COAST FRIDAY BEFORE SETTLING OVER EASTERN CALIFORNIA AND WESTERN NEVADA FOR THE BULK OF NEXT WEEKEND. THE 12Z OPERATIONAL GFS/EC/GEM INDICATE THE MAIN FRONTAL PRECIPITATION OVER CENTRAL AND EASTERN NEVADA WITH A MORE UNCERTAIN DEFORMATION BAND TO THE NORTH AND EAST OF THE UPPER LOW CENTER FOR FRIDAY NIGHT AND/OR SATURDAY. THE DEFORMATION BAND WOULD BE THE MAIN FOCUS FOR RAIN OVER NORTHEAST CALIFORNIA AND WESTERN NEVADA. HOWEVER, MODELS VARY CONSIDERABLY ON WHERE TO PUT THE DEFORMATION BY

SATURDAY, WITH THE GFS/GEM OVER NORTHWEST NEVADA AND NORTHEAST CALIFORNIA AND THE ECMWF MORE OVER OREGON. WITH THIS IN MIND, I WAS UNABLE TO MAKE ANY MEANINGFUL ADJUSTMENT TO POP WITH THIS PACKAGE.

DAYTIME TEMPERATURES WILL FALL TO AROUND 6 TO 10 DEGREES BELOW AVERAGE OVER THE WEEKEND AS THE UPPER LOW SETTLES OVERHEAD. THE COOLER HIGHS WILL SET THE STAGE FOR NEAR FREEZING TEMPERATURES FOR TYPICALLY COLDER LOWER VALLEYS. THIS IS POSSIBLE BY SUNDAY MORNING BUT MOST LIKELY BY MONDAY MORNING AS SURFACE HIGH PRESSURE BUILDS INTO WESTERN NEVADA AND POTENTIAL CLOUD COVER (DEFORMATION BAND) ON SUNDAY CLEARS OUT.

DRIER CONDITIONS RETURN EARLY NEXT WEEK AS THE UPPER LOW KICKS OFF TO THE EAST. HOWEVER, TEMPERATURES WILL BECOME MORE UNCERTAIN AS THE ECMWF AND GEM DROP ADDITIONAL ENERGY INTO THE NORTHWEST CONUS FOR CONTINUED BELOW AVERAGE TEMPERATURES WHILE THE GFS BUILDS A FLAT RIDGE OVERHEAD FOR MORE TYPICAL (MID-UPPER 70S LOWER VALLEYS) HIGHS BY EARLY NEXT WEEK. SNYDER

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
306 AM PDT WED SEP 24 2014

.SYNOPSIS...
DEVELOPING LOW PRESSURE IN THE PACIFIC WILL BRING INCREASING
WINDS AND COOLING TEMPERATURES THROUGH THURSDAY. SMOKE FROM THE
KING FIRE WILL CONTINUE TO AFFECT THE TAHOE BASIN AND WESTERN
NEVADA. THE LOW PRESSURE SYSTEM WILL BRING POSSIBLE SHOWERS
BEGINNING LATE TONIGHT INTO THE WEEKEND.

&&

.SHORT TERM...
A LOW PRESSURE SYSTEM DEVELOPING OVER THE EAST PACIFIC WILL
CONTINUE TO BE OUR PRIMARY WEATHER MAKER FOR THE REST OF THIS WEEK
AS IT BRINGS INCREASING WINDS TODAY AND THURSDAY FOLLOWED BY
COOLER TEMPERATURES AND AT LEAST A SMALL CHANCE OF SHOWERS.

* SMOKE: SMOKE FROM THE KING WILDFIRE WILL BE A PROBLEM TODAY
   ESPECIALLY AS INCREASING WINDS AND DRIER CONDITIONS POTENTIALLY
   RESULT IN INCREASED FIRE ACTIVITY. THE FLOW ALOFT IS BECOMING
   MORE SOUTHERLY AND LIKE TUESDAY, WE THINK THE VAST MAJORITY OF
   THE SMOKE WILL AFFECT THE NORTHERN TAHOE BASIN (GENERALLY I-80)
   AND EXPAND INTO THE SIERRA VALLEY AS FAR NORTH AS PLUMAS
   COUNTY. THERE MAY BE A BRIEF TURN OF THE WINDS TO THE WEST
   EARLY THIS EVENING WHICH WILL BRING SOME SMOKE INTO THE RENO
   AREA. HOWEVER IT IS NOT EXPECTED TO BE AS DENSE OR LONGLIVED.
   WE HAVE CANCELED THE DENSE SMOKE ADVISORY FOR THE RENO AREA BUT
   EXPANDED IT NORTH TO INCLUDE PLUMAS AND SIERRA COUNTIES TODAY.
   SMOKE WILL LIKELY STAY IN THE TAHOE BASIN TONIGHT AND MAINLY

NEAR THE CREST AS STRONG SOUTHERLY FLOW CONTINUES. WE WILL HAVE TO WATCH THE FIRE ACTIVITY AS WE HEAD INTO THURSDAY AS WINDS ARE EXPECTED TO TURN MORE WESTERLY BY MID TO LATE AFTERNOON WHICH COULD PUSH QUITE A BIT OF SMOKE INTO THE TAHOE BASIN AND SIERRA FRONT.

* WINDS: WINDS TODAY WILL INCREASE ALONG THE RIDGES AND ESPECIALLY IN AREAS NORTH OF I-80. THEY LOOK WEAKER ACROSS MANY OF THE OTHER AREAS AND THUS WE HAVE CANCELED THE LAKE WIND ADVISORY FOR PYRAMID LAKE. WINDS ALOFT PEAK TONIGHT AND THURSDAY MORNING WITH STRONG WINDS EXPECTED ALL AREAS WITH THE FRONT BY THURSDAY AFTERNOON. GUSTS WILL APPROACH 40 MPH AND THIS WILL RESULT IN CHOPPY LAKE WATERS. THE WIND ADVISORY FOR TAHOE IS NOW IN EFFECT FROM LATE THIS MORNING THROUGH EARLY THURSDAY EVENING AS THE ATMOSPHERE IS UNLIKELY TO DECOUPLE TONIGHT.

* PRECIPITATION: VERY LITTLE HAS CHANGED WITH EXPECTED SHOWERS WITH THIS FRONT AS DYNAMICS WILL BE LIMITED TO LATE TONIGHT INTO THURSDAY MORNING WITH WEAK INSTABILITY PRESENT. HOWEVER CONFIDENCE IS HIGHER THAT PARTS OF NORTHEAST CA AND FAR NORTHWEST NV WILL SEE MEASUREABLE PRECIPITATION AND THUS WE BOOSTED POPS FOR THE 06Z- 18Z TIME FRAME. SHOWERS QUICKLY FALL APART THURSDAY AFTERNOON AS ENERGY EXITS TROUGH. WE MAY SEE A FEW SHOWERS AS FAR SOUTH AS HIGHWAY 50, BUT QPF WILL BE LIGHT. THE NEXT BEST CHANCE OF SHOWERS WILL OCCUR FRI AFTN-FRI NIGHT AS UPPER LOW DROPS INTO THE NORTHERN SIERRA AND SHORTWAVE ENERGY MOVES NORTHEASTWARD ACROSS WESTERN NV. THERE IS STILL SOME UNCERTAINTY WITH THE TRACK AND THUS WE HAVE KEPT POPS IN THE SLIGHT CHC CATEGORY. HOWEVER, COOLING ALOFT WILL RESULT IN BETTER INSTABILITY AND WE HAVE ADDED A SLIGHT CHANCE OF THUNDER FOR FRIDAY AFTERNOON AND EVENING.

* TEMPERATURES: TEMPERATURES WILL BE ABOVE NORMAL FOR ONE MORE
   DAY WITH 70S SIERRA VALLEYS AND 80S TO NEAR 90 FOR WARMER NV
   VALLEYS. AS THE TROUGH MOVES INLAND THURSDAY, TEMPERATURES WILL
   FALL CLOSER TO NORMAL LEVELS AND ACTUALITY AROUND 10 DEGREES
   BELOW NORMAL BY FRIDAY AS UPPER LOW SETTLES ACROSS THE AREA.

.LONG TERM...SATURDAY THROUGH TUESDAY...
MODELS CONTINUE TO SHOW A SLOW MOVEMENT OF THE UPPER LOW THROUGH THE
GREAT BASIN THIS WEEKEND. EC CONTINUES TO BE SLOWER THAN THE GFS AND
WILL CONTINUE TO USE A BLEND. EARLY NEXT WEEK, MODELS ARE NOW
FLATTER WITH THE SHORT WAVE RIDGE. IN ADDITION, THE MODELS/ENSEMBLES
ARE COMING MORE IN LINE WITH THE EC REGARDING AN INSIDE
SLIDER/BACKDOOR FRONT FOR LATE TUESDAY INTO WEDNESDAY.

FOR THE WEEKEND, CONTINUED THE SLIGHT CHANCE MENTION OF SHOWERS WITH
SNOW LEVELS 8-9000 FEET. THE MODELS CONTINUE TO SHOW THE BEST
DEFORMATION ACROSS NORTHEAST NEVADA. THEREFORE EXPECT MOST OF THE
PRECIP TO BE IN THE FORM OF SHOWERS WITH THE COLD POOL FROM THE
UPPER LOW OVERHEAD. TEMPS WILL REMAIN A FEW DEGREES BELOW AVERAGE,
BUT OVERNIGHT LOWS DO NOT LOOK TO BE THAT COLD AT LEAST UNTIL SUNDAY
NIGHT. THE CLOUD COVER AND MOISTURE SHOULD PREVENT LOWS FROM REALLY
BOTTOMING OUT ON SATURDAY NIGHT. AS MENTIONED IN THE PREVIOUS
DISCUSSION, NORMALLY COLDER SPOTS WILL LIKELY DROP WELL BELOW
FREEZING IN THE SIERRA WITH A FEW COLD SPOTS IN WESTERN NEVADA ALSO
NEAR FREEZING.

EARLY NEXT WEEK, THE SHORT WAVE RIDGE IS WEAKER WITH THE BACKDOOR
FRONT FOR LATE TUESDAY NOW. HAVE COOLED OFF TEMPS EARLY NEXT WEEK
KEEPING THEM SLIGHTLY BELOW AVERAGE AS A RESULT. IF THE
DETERMINISTIC MODELS ARE CORRECT, WEDNESDAY COULD BE QUITE COOL
BEHIND THE FRONT. HOWEVER, THE ENSEMBLES STILL SHOW SOME UNCERTAINTY
AS TO HOW FAR WEST, AND THEREFORE HOW COLD, THE BACKDOOR FRONT
WILL BE. WALLMANN

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE RENO NV
312 PM PDT WED SEP 24 2014

.SYNOPSIS...
LOW PRESSURE IN THE PACIFIC WILL MOVE INTO THE WEST TOMORROW, THEN REMAIN OVER NEVADA INTO THE WEEKEND. GUSTY WINDS WILL CONTINUE TODAY AND TOMORROW, WITH COOLER TEMPERATURES AND A CHANCE OF SHOWERS FOR THE END OF THE WEEK. SMOKE FROM THE KING FIRE WILL CONTINUE TO AFFECT THE REGION. WINDS WILL SHIFT LATE FRIDAY AND SATURDAY WHICH SHOULD KEEP SMOKE OUT OF THE AREA THIS WEEKEND.

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.SHORT TERM...
TROUGH IS APPROACHING THE WEST COAST WITH DRY AND WINDY CONDITIONS IN THE NORTHERN SIERRA...NORTHWEST NEVADA AND NORTHEAST CALIFORNIA. PEAK GUSTS OF 30 TO 40 MPH HAVE BEEN REPORTED SO FAR TODAY. AS THE TROUGH MOVES CLOSER TO THE COAST TONIGHT AND THURSDAY, GUSTY WINDS WILL SPREAD SOUTH AND PERSIST THROUGH TONIGHT AND MOST OF THURSDAY AROUND THE TAHOE BASIN, EASTERN SIERRA AND ACROSS WESTERN NEVADA SOUTH OF INTERSTATE 80.

THE WINDS WILL CONTINUE TO PUSH SMOKE FROM THE KING FIRE INTO THE TAHOE BASIN, NORTHEAST CALIFORNIA AND WESTERN NEVADA. A DENSE SMOKE ADVISORY REMAINS IN EFFECT FOR THE TAHOE BASIN AND PORTIONS OF SIERRA, PLUMAS AND LASSEN COUNTIES. WINDS THURSDAY SHOULD SHIFT A BIT MORE TO PUSH THE SMOKE ACROSS AND AREA ROUGHLY FROM SUSANVILLE-GERLACH SOUTHWARD TO HIGHWAY 50. AMOUNT OF SMOKE DEPENDS ON FIRE ACTIVITY, WHICH COULD BE DIMINISHED BY INCREASED HUMIDITY AND LIGHT RAINFALL.

MAIN BAND OF PRECIPITATION AHEAD OF THE LOW IS CURRENTLY ALONG THE NORTHWEST CALIFORNIA COAST AND WILL SLOWLY MOVE EAST TONIGHT. A FEW LIGHT SHOWERS MAY REACH WESTERN LASSEN COUNTY BY SUNRISE THURSDAY MORNING. BEST CHANCE OF PRECIPITATION IS FROM ABOUT MID MORNING THURSDAY THROUGH EARLY THURSDAY EVENING FROM DONNER/YUBA PASSES NORTHWARD TO LASSEN COUNTY. RAINFALL AMOUNTS OF 0.25 TO 0.50 INCH ARE POSSIBLE, THOUGH THE PRECIPITATION BAND WILL WEAKEN AS IT MOVES INLAND. A FEW LIGHT SHOWERS MAY REACH RENO-CARSON-TAHOE THURSDAY AFTERNOON.

BY FRIDAY THE TROUGH WILL REACH THE SIERRA WITH A CUT OFF LOW STARTING TO DEVELOP OVER CENTRAL CALIFORNIA. THIS WILL LEAD TO MUCH COOLER CONDITIONS AND HIGHER HUMIDITY ALONG WITH DECREASING WINDS. TYPICALLY HIGHER HUMIDITY AND LIGHT WINDS WILL DECREASE FIRE ACTIVITY, LEADING TO LESS SMOKE MOVING EAST OF THE SIERRA CREST. AFTERNOON HIGHS FRIDAY WILL DROP INTO THE LOW TO MID 60S FOR THE SIERRA WITH UPPER 60S TO MID 70S FOR WESTERN NEVADA. THE CUT OF LOW SHOULD BE OVER WESTERN NEVADA FRIDAY NIGHT, WHICH COULD BRING A LARGE AREA OF SHOWERS OR LIGHT RAIN TO THE REGION. BRONG

.LONG TERM...SATURDAY THROUGH WEDNESDAY...
MAIN CHANGE TO THE LONG TERM FORECAST WAS TO RAISE POP A BIT SATURDAY FOR MOST BASIN AREAS NORTH OF HAWTHORNE AND TO RAISE MINIMUM HUMIDITIES OVER THE WEEKEND AREAWIDE.

MODELS ARE COMING IN LINE WITH KEEPING THE UPPER LOW OVER EASTERN CALIFORNIA AND NEVADA FOR MOST OF THE WEEKEND. ALSO, THE GEFS PRECIPITATION PROGS SUPPORT INCREASED POP FOR AT LEAST SATURDAY. THEREFORE, I RAISED POP TO THE CHANCE CATEGORY FOR MANY BASIN AREAS ON SATURDAY AND INTO SUNDAY MORNING EAST OF A FALLON TO ALTURAS LINE. THE BEST SHOT MAY BE TO THE NORTH AND NORTHEAST OF THE LOW IN THE SYSTEM'S DEFORMATION ZONE, HENCE THE UPPING OF POP IN THE ABOVE MENTIONED AREAS.

WITH 700 MB TEMPERATURES DOWN TO BETWEEN -2C AND 0C, SNOW LEVELS ARE EXPECTED TO FALL TO 8000 TO 8500 FEET, POSSIBLY A BIT LOWER IN HEAVIER SHOWERS. ALSO, WITH THE SHOWERS AND FAIRLY LOW FREEZING LEVEL, VERY ISOLATED THUNDERSTORMS CANNOT BE RULED OUT. IN ADDITION, THE COLDER 700 MB TEMPERATURES WILL LIMIT HIGHS IN THE LOWER VALLEYS TO THE 60S, OR AROUND 10 DEGREES BELOW AVERAGE.

FOR THE FIRST PART OF NEXT WEEK, NORTHWEST FLOW ALOFT WITH ADDITIONAL DISTURBANCES MOVING THROUGH THE NORTHWEST CONUS WILL KEEP TEMPERATURES ALOFT FROM WARMING TOO DRAMATICALLY. THIS SHOULD LEAD TO DAYTIME TEMPERATURES SLIGHTLY BELOW AVERAGE MONDAY THROUGH WEDNESDAY.
SNYDER