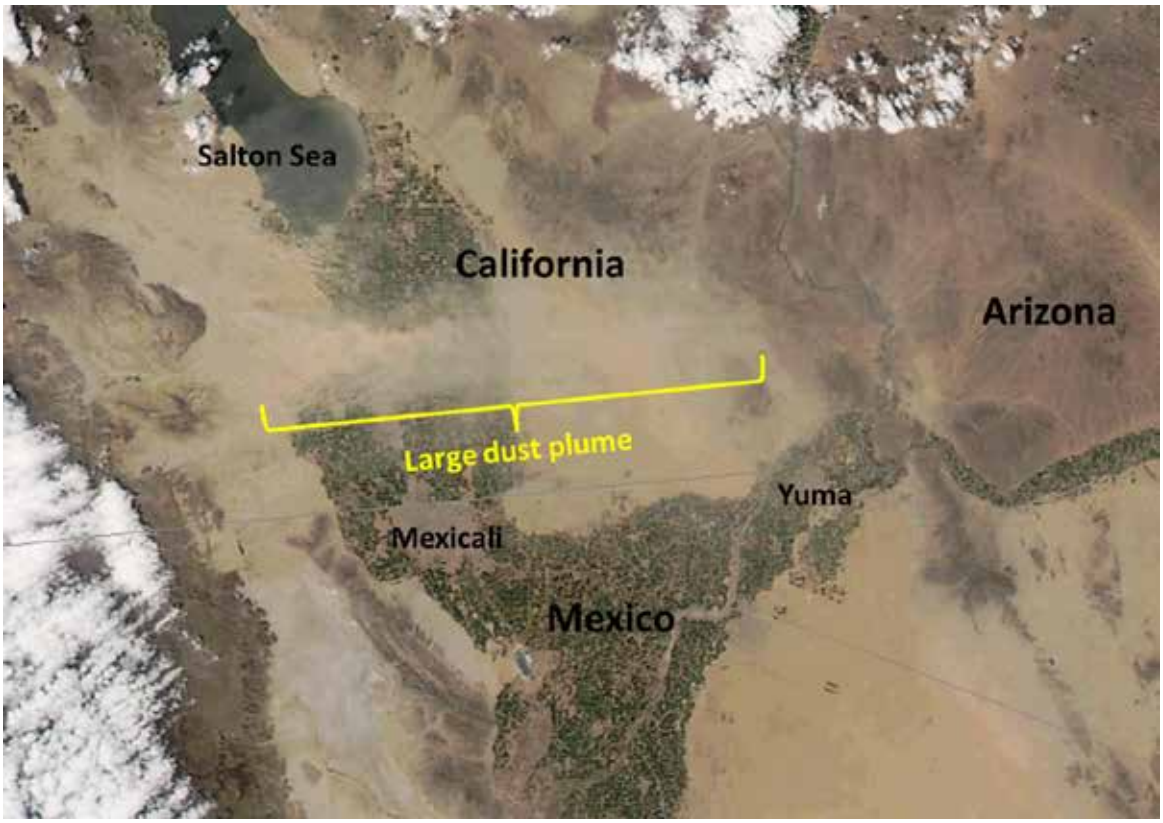
Sonoma Technology, Inc.
Air Quality Research and Innovative Solutions

State of Arizona Exceptional Event Documentation for the Statewide Event of April 8–9, 2013



Final Report Prepared for

Arizona Department of Environmental Quality
Phoenix, AZ

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State of Arizona Exceptional Event Documentation for the Statewide Event of April 8−9, 2013

Final Report
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Cover graphic is a MODIS image from about 13:40 MST on April 8, 2013. A large dust plume was present over southeastern California, moving east. See Section 3 for more information.

Acknowledgments

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Glossary

Term	Definition
AAC	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
AFB	Air Force Base
Ag BMP	Agricultural Best Management Program
ANA	Ajo Nonattainment Area
AQS	Air Quality System
AZMET	Arizona Meteorological Network
AZURITE	Arizona Unified Repository for Information Tracking of the Environment
BACM	Best Available Control Measures
BAM	Beta Attenuation Monitor
BSCP	Brick and structural clay products
CAA	Clean Air Act
CDV	Critical design value
DNA	Douglas Nonattainment Area
EER	Exceptional Events Rule
EPA	U.S. Environmental Protection Agency
FMIR	Fort McDowell Indian Reservation
FRM	Federal Reference Method
GRAV	Gravimetric Analysis
GRIC	Gila River Indian Community
GSA	General Services Administration
HIR	Hualapai Indian Reservation
HNA	Hayden Nonattainment Area
HPA	High Pollution Advisory
HYSPLIT	Hybrid Single-Particle Lagrangian Integrated Trajectory
HZ	Haze
IC	Internal combustion
ICI	Industrial/commercial/institutional
ICAPCD	Imperial County Air Pollution Control District
I-10	Interstate 10
IJ	Qualifier flag for high winds
KDUG	Bisbee-Douglas International Airport
KNYL	Yuma Marine Corps Air Station
KOLS	Nogales Airport
KPHX	Phoenix Sky Harbor Airport
KTUS	Tucson International Airport
LMP	Limited Maintenance Plan
MAG	Maricopa Association of Governments

Term	Definition
MCAS	Yuma Marine Corps Air Station
MCAQD	Maricopa County Air Quality Department
MSM	Most Stringent Measure
msl	Mean sea level
MST	Mountain Standard Time
NAAQS	National Ambient Air Quality Standards
NEP	The EPA's Natural Events Policy
NEAP	Natural Events Action Plan
NNA	Nogales Nonattainment Area
NNIR	Navajo Nation
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NWS	National Weather Service
OHV	Off-highway vehicle
PCAQCD	Pinal County Air Quality Control District
PCDEQ	Pima County Department of Environmental Quality
PM	Particulate matter
PM_{10}	Particulate matter less than 10 microns in diameter.
POE	Port of Entry
RACM	Reasonably available control measures
RACT	Reasonably available control technology
RE	Rule effectiveness
RJ	qualifier flag for high winds
RNA	Rillito Nonattainment Area
SCAQMD	South Coast Air Quality Management District
SIP	State implementation plan
SRPMIC	Salt River Pima-Maricopa Indian Community
TEOM	Tapered Element Oscillating Microbalance
TIP	Transportation Improvement Plan
TMIR	Torres-Martinez Indian Reservation
TPY	Tons per year
TSP	Total suspended particulate matter
W	Qualifier flag for flow rate average out of specification.
WMAT	White Mountain Apache Tribe
YMPO	Yuma Metropolitan Planning Organization

1. Introduction

On April 8 and 9, 2013, numerous sites across Arizona reported exceedances of the 24-hour average PM_{10} National Ambient Air quality Standard (NAAQS) of 150 µg/m^3 (PM_{10} is particulate matter less than 10 microns in diameter.) The purpose of this report is to demonstrate that these exceedances were due to naturally occurring windblown dust, were not reasonably controllable or preventable, were historically unusual, and would not have occurred "but-for" the windblown dust and that they therefore constitute an Exceptional Event as defined by the U.S. Environmental Protection Agency's (EPA) Exceptional Events Rule (EER).

1.1 Report Contents

This report provides exceptional event documentation for an event spanning seven Arizona nonattainment areas. Some of the material herein is relevant to all of the nonattainment regions, while other information is region-specific. Sections of the report containing region-specific information are divided into subsections for each nonattainment area.

Section 2 of this assessment contains a conceptual model of the cold-front-driven windblown dust event that occurred on April 8 and 9, 2013, providing background information regarding the climate, geographic setting of monitors, and history of attainment for each of the affected nonattainment areas in Arizona. Section 2 also provides an overall explanation of how the event affected air quality, and evidence that the event was a natural event.

Section 3 of this assessment establishes a clear causal connection between the natural event on April 8 and 9, 2013, and the exceedances of the 24-hr PM_{10} standard at the monitoring stations. The evidence in this section also confirms that the event in question both affected air quality and was the result of natural events.

Section 4 of this assessment contains data summaries and time-series graphs which help illustrate that the event of April 8−9, 2013, produced PM_{10} concentrations in excess of normal historical fluctuations.

Section 5 of this assessment details the existing dust control measures in each nonattainment area and demonstrates that despite the presence and enforcement of these controls, the event of April 8−9, 2013, was not reasonably controllable or preventable.

Section 6 of this assessment builds upon the demonstration, showing a clear causal connection between the natural event and the exceedances, and concludes that the exceedances of the 24-hr PM_{10} standard on April 8 and 9, 2013, would not have occurred but for the event.

Appendix A contains time-series graphs and data tables to supplement Section 3. **Appendix B** contains links to videos, images, and media reports to supplement Section 3. **Appendix C** contains historical time-series and histogram graphs to supplement Section 4. **Appendix D** contains air quality forecasts issued by the Arizona Department of Environmental Quality (ADEQ) and weather statements and warnings issued by the National Weather Service

(NWS). **Appendix E** contains a copy of the affidavit of public notice concerning this assessment report.

1.2 Exceptional Event Rule Requirements

In addition to the technical requirements that are contained within the EER, procedural requirements must also be met for the EPA to concur with the flagged air quality monitoring data. This section of the report contains the requirements of the EER and associated guidance, and discusses how ADEQ has addressed those requirements.

1.2.1 Public Notification That the Event Was Occurring (40 CFR 50.14(c)(1)(i))

ADEQ issued Air Quality Forecasts for Maricopa County indicating that southwesterly winds of 25 to 35 mph, gusting to over 45 mph at times, could generate blowing dust and contribute to an elevated risk of unhealthy PM_{10} levels on April 8. ADEQ issued a similar forecast for the Green Valley area, where westerly winds of 15 to 25 mph were also expected to generate blowing dust on April 8. More information on ADEQ's forecasting program can be found in Section 5.2 of this report. The forecasts and advisories that were issued for April 8 and 9, 2013, are included in Appendix D.

1.2.2 Place Informal Flag on Data in AQS (40 CFR 50.14(c)(2)(ii))

ADEQ and other operating air quality agencies in Arizona submit data into the EPA's Air Quality System (AQS), the official repository of ambient air quality data. This data submittal to AQS includes particulate matter (PM) data from both filter-based and continuous monitors operated in Arizona.

When ADEQ and/or another agency operating monitors in Arizona suspects that data may be influenced by an exceptional event, ADEQ and/or the other operating agency expedites analysis of the filters collected from the potentially affected filter-based air monitoring instruments, quality-assures the results, and submits the data into AQS. ADEQ and/or other operating agencies also submit data from continuous monitors into AQS after quality assurance is complete.

If ADEQ and/or other operating air quality agencies determine that the potential exists for a monitor's reading(s) to be influenced by an exceptional event, a preliminary flag is submitted for the measurement in AQS. The data are not official until they undergo more thorough quality assurance and quality control, leading to certification by May 1 following the calendar year in which the data were collected (40 CFR 58.15(a)(2)). The presence of the flag can be confirmed in AQS.

1.2.3 Notify EPA of Intent to Flag Through Submission of Initial Event Description by July 1 of Calendar Year Following Event (40 CFR 50.14(c)(2)(iii))

ADEQ submitted a letter to EPA on September 11, 2013, listing all days for calendar years 2011–2013 that ADEQ intends to analyze under the EER. The PM_{10} exceedances that

occurred on April 8 and 9, 2013, were included on this list. This assessment report demonstrates support for the flagging of these data.

1.2.4 Document That the Public Comment Process Was Followed for Event Documentation (40 CFR 50.14(c)(3)(iv))

ADEQ posted this assessment report on the ADEQ webpage and placed a hard copy of the report in the ADEQ Records Management Center for public review. ADEQ opened a 30-day public comment period on February 7, 2014. A copy of the public notice certification, along with any comments received, will be submitted to EPA, consistent with the requirements of 40 CFR 50.14(c)(3)(iv). See Appendix E for a copy of the affidavit of public notice.

1.2.5 Submit Demonstration Supporting Exceptional Event Flag (40 CFR 50.14(a)(1-2))

At the close of the public comment period, and after ADEQ has had the opportunity to consider any comments submitted on this document, ADEQ will submit this document, the comments received, and ADEQ's responses to those comments to EPA Region 9 headquarters in San Francisco, California. The deadline for the submittal of this package is June 30, 2016.

1.2.6 Documentation Requirements (40 CFR 50.14(c)(3)(iii))

The EER states that in order to justify the exclusion of air quality monitoring data, evidence must be provided for the following elements:

1. The event satisfies the criteria set forth in 40 CFR 50.1(j) that
    a. the event affected air quality,
    b. the event was not reasonably controllable or preventable, and
    c. the event was caused by human activity unlikely to recur in a particular location or was a natural event;
2. There is a clear causal relationship between the measurement(s) under consideration and the event;
3. The event is associated with a measured concentration(s) in excess of normal historical fluctuations; and
4. There would have been no exceedance or violation but for the event.

2. Conceptual Model

This section describes the meteorological and air quality conditions during the regional dust event on April 8 and 9, 2013. It also provides a narrative background of each of the seven nonattainment regions in southern Arizona affected by this windblown dust event (**Figure 2-1**). The nonattainment regions are Phoenix/Maricopa County, Yuma, Ajo, Rillito, Hayden/Miami, Douglas, and Nogales. The background information is organized into subsections by nonattainment area. Elements described in each subsection include

- A description and map of the geographic setting of the air quality and meteorological monitors.[1]
- A brief description of the history of the region's PM_{10} attainment status.

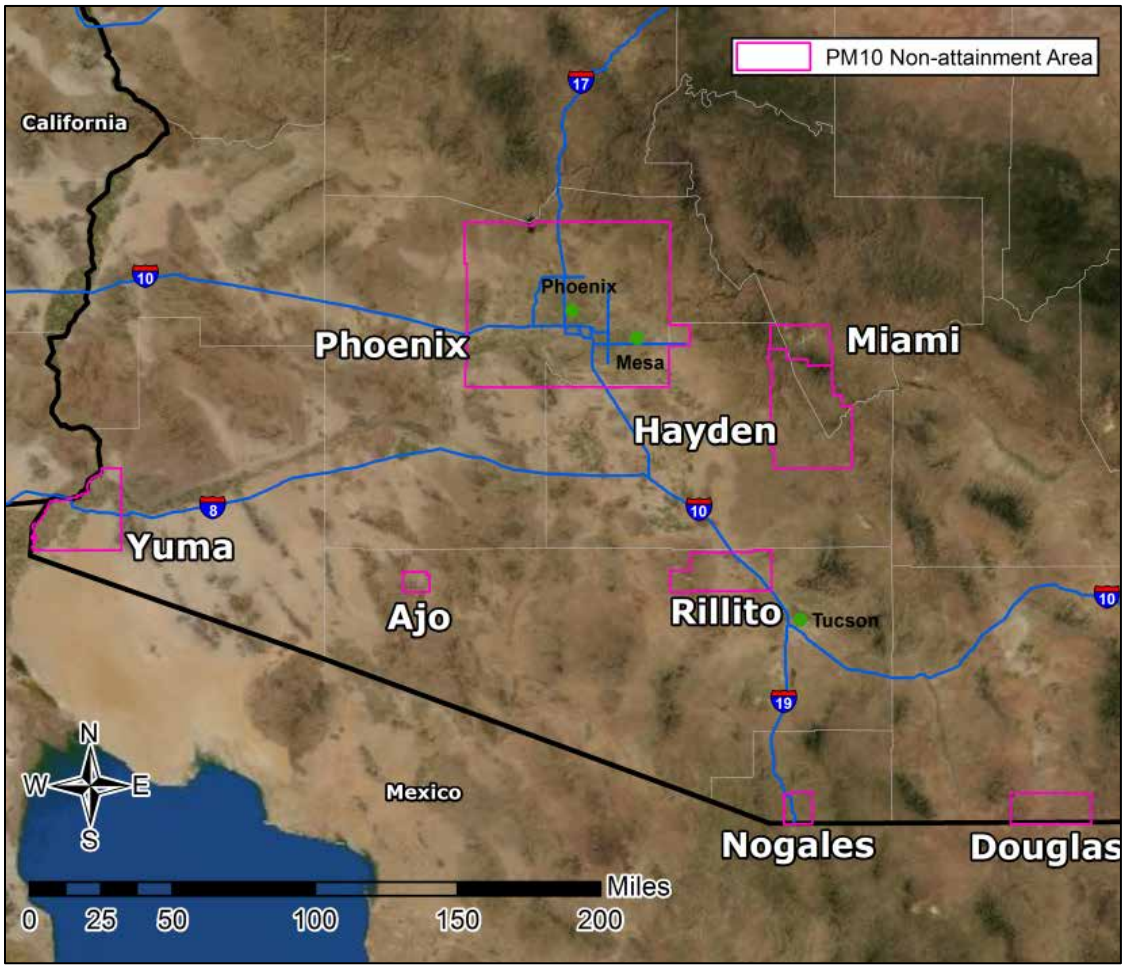

Figure 2-1. PM_{10} nonattainment areas in southern Arizona. A portion of western Pinal County is also a designated PM_{10} nonattainment area, but exceedances recorded in this area are not covered in this report.

[1] AQS monitors measure air quality and meteorological data; Arizona Meteorological Network (AZMET) and NWS monitors measure meteorological data only.

2.1 Event Day Summary

While windblown dust events in Arizona during the summer monsoon season are often due to outflow winds from thunderstorms, windblown dust events in the fall, winter, and spring are usually due to strong winds associated with low-pressure systems and cold fronts moving southeast across California and Arizona. These winds are the result of strong surface pressure gradients between the approaching low-pressure system (or cold front) and higher pressure ahead of it. As the low-pressure system (or cold front) approaches and passes, gusty southwesterly winds typically shift to westerly or northwesterly. The strong winds can loft dust into the air and transport it over long distances, especially if soils in the region are dry.

On April 8, 2013, a powerful upper-level trough of low pressure and an associated cold front were moving eastward across southern California into western Arizona, and a tight pressure gradient associated with this front produced strong southwesterly winds throughout southern Arizona (**Figure 2-2**). These winds lofted substantial amounts of dust into the lower atmosphere, resulting in widespread high PM_{10} concentrations and exceedances of the NAAQS at numerous monitors in Arizona and southeastern California (**Table 2-1**). As the cold front moved through Arizona late on April 8 and early on April 9, winds diminished, temperatures cooled, and the atmosphere stabilized. These conditions reduced particle dispersion, causing the dust that had been lofted by the strong winds on April 8 to remain suspended in the lower atmosphere. As a result, high PM_{10} concentrations were measured in southeastern Arizona early on April 9, despite low wind speeds. The PM_{10} concentrations during this period were high enough to result in exceedances of the NAAQS at several monitors in southeastern Arizona (**Table 2-2**). Later on April 9, stronger winds helped to disperse the suspended dust and transport it out of southeastern Arizona.

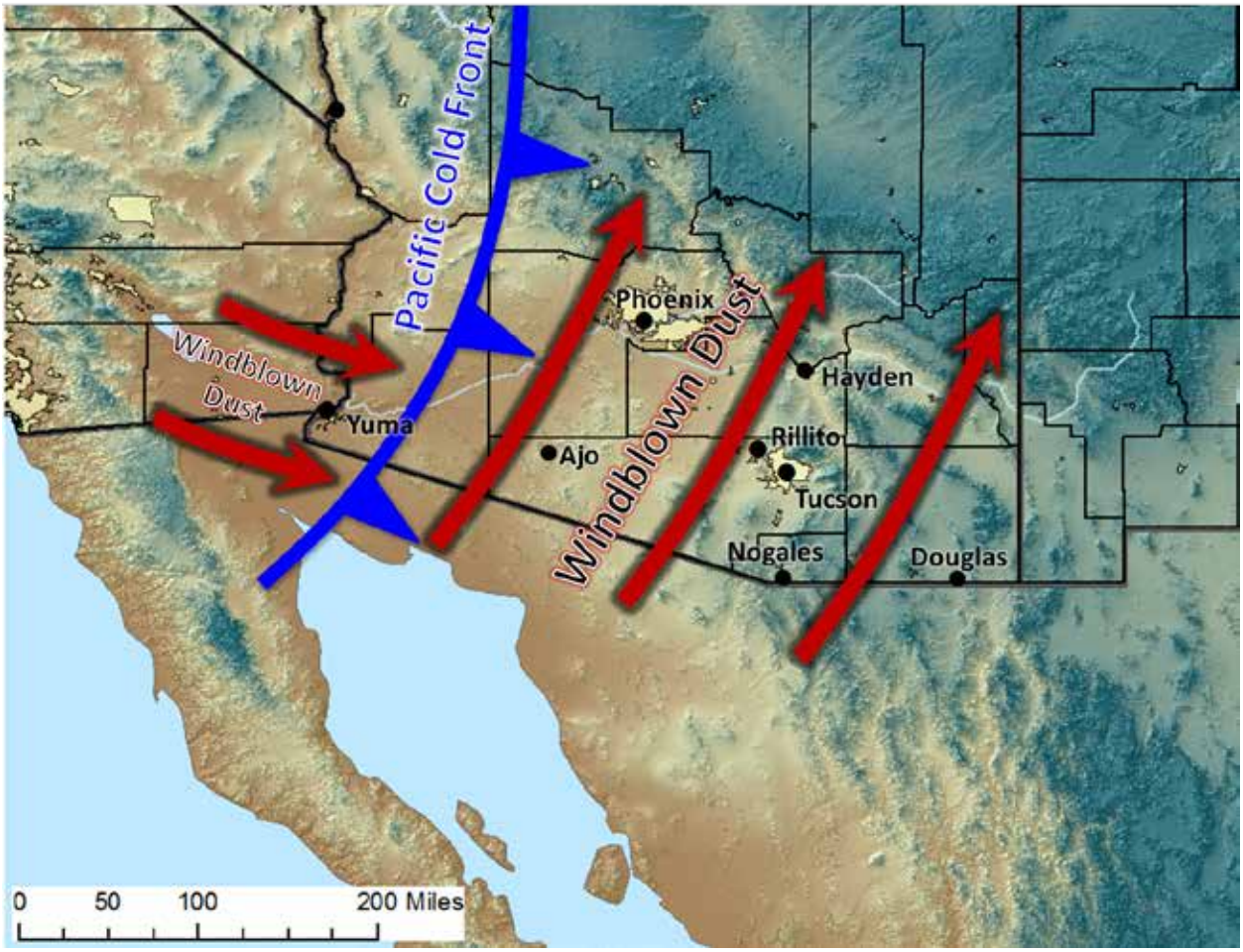

Figure 2-2. Strong southwesterly winds ahead of an approaching cold front lofted and transported dust across southeastern California, southern Arizona, and northwestern Mexico on April 8 and 9, 2013. Strong west-northwesterly winds behind the front lofted and transported dust into Yuma and eastward across southern Arizona; this dust later caused high PM_{10} concentrations in southeastern Arizona early on April 9.

Table 2-1. PM_{10} measurements collected in Arizona on April 8, 2013. Monitors specific to this report with data that exceeded the NAAQS are shown in **bold green**.

Page 1 of 2

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg PM_{10} ($\mu g/m^3$)	1-hr Max PM_{10} $\mu g/m^3$)	Time of Max 1-hr PM_{10} (MST)	AQS Qualifier Flag
Arizona							
Apache County							
N/A	TEOM	WMAT	04-001-1003-81102-1	55	119	1200	
Cochise County							
Paul Spur Chemical Lime Plant	TEOM	ADEQ	04-003-0011-81102-3	89	582	1300	IJ
Douglas Red Cross	**TEOM**	**ADEQ**	**04-003-1005-81102-3**	**252**	**924**	**1500**	**RJ**
Gila County							
Hayden Old Jail	**TEOM**	**ADEQ**	**04-007-1001-81102-3**	**408**	**1798**	**2100**	**RJ**
Miami Golf Course	TEOM	ADEQ	04-007-8000-81102-3	129	405	1500	IJ
Maricopa County							
West Phoenix	**BAM**	**MCAQD**	**04-013-0019-81102-1**	**189**	**726**	**1400**	**RJ**
Mesa	TEOM	MCAQD	04-013-1003-81102-1	151	630	1700	
North Phoenix	TEOM	MCAQD	04-013-1004-81102-1	149	629	1500	
Glendale	**TEOM**	**MCAQD**	**04-013-2001-81102-1**	**172**	**697**	**1300**	**RJ**
Central Phoenix	**TEOM**	**MCAQD**	**04-013-3002-81102-4**	**184**	**523**	**1500**	**RJ**
South Scottsdale	TEOM	MCAQD	04-013-3003-81102-1	143	514	1000	
Greenwood	**TEOM**	**MCAQD**	**04-013-3010-81102-1**	**207**	**667**	**1400**	**RJ**
South Phoenix	**TEOM**	**MCAQD**	**04-013-4003-81102-1**	**186**	**643**	**0900**	**RJ**
West Chandler	**TEOM**	**MCAQD**	**04-013-4004-81102-1**	**234**	**848**	**1700**	**RJ**
Tempe	TEOM	MCAQD	04-013-4005-81102-1	147	520	1700	
Higley	**TEOM**	**MCAQD**	**04-013-4006-81102-1**	**211**	**621**	**0900**	**RJ**
West 43rd Ave	**TEOM**	**MCAQD**	**04-013-4009-81102-1**	**301**	**951**	**1200**	**RJ**
Dysart	TEOM	MCAQD	04-013-4010-81102-1	148	477	1200	
Buckeye	**TEOM**	**MCAQD**	**04-013-4011-81102-1**	**298**	**1338**	**1800**	**RJ**
Zuni Hills	**TEOM**	**MCAQD**	**04-013-4016-81102-1**	**166**	**669**	**1200**	**RJ**
Fort McDowell/Yuma Frank	TEOM	FMIR	04-013-5100-81102-3	148	374	1500	
St Johns	TEOM	GRIC	04-013-7003-81102-1	257	1148	1200	RJ
High School Air Monitoring Station	TEOM	SRPMIC	04-013-7024-81102-2	222	748	1700	
Durango Complex	**TEOM**	**MCAQD**	**04-013-9812-81102-1**	**209**	**569**	**1500**	**RJ**
JLG Supersite	**BAM**	**ADEQ**	**04-013-9997-81102-3**	**164**	**666**	**1400**	**RJ**
Mohave County							
Bullhead City	TEOM	ADEQ	04-015-1003-81102-3	70	286	0900	
Navajo County							
N/A	TEOM	WMAT	04-017-1002-81102-1	84	283	1600	

Table 2-1. PM_{10} measurements collected in Arizona on April 8, 2013. Monitors specific to this report with data that exceeded the NAAQS are shown in **bold green**.

Page 2 of 2

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg PM_{10} ($\mu g/m^3$)	1-hr Max PM_{10} $\mu g/m^3$)	Time of Max 1-hr PM_{10} (MST)	AQS Qualifier Flag
Pima County							
Ajo	**TEOM**	**ADEQ**	**04-019-0001-81102-3**	**315**	**1375**	**2000**	**RJ**
Orange Grove	GRAV	PCDEQ	04-019-0011-81102-2	115	N/A	N/A	
Rillito	**TEOM**	**ADEQ**	**04-019-0020-81102-3**	**364**	**1555**	**1100**	**RJ**
South Tucson	**GRAV**	**PCDEQ**	**04-019-1001-81102-1**	**156**	**N/A**	**N/A**	**RJ**
Green Valley	TEOM	PCDEQ	04-019-1030-81102-1	70	231	1200	
Geronimo	BAM	PCDEQ	04-019-1113-81102-1	150	558	1500	
Pinal County							
Casa Grande Downtown	TEOM	PCAQCD	04-021-0001-81102-3	302	994	1500	RJ
Apache Junction Fire Station	TEOM	PCAQCD	04-021-3002-81102-3	152	570	1600	
Pinal Air Park	TEOM	PCAQCD	04-021-3007-81102-3	261	1284	1500	RJ
Stanfield	TEOM	PCAQCD	04-021-3008-81102-3	446	2575	1000	RJ
Combs	TEOM	PCAQCD	04-021-3009-81102-3	300	2035	1000	RJ
Maricopa	TEOM	PCAQCD	04-021-3010-81102-3	334	1584	2000	RJ
Pinal County Housing (Aka Eleven Mile Corner)	TEOM	PCAQCD	04-021-3011-81102-3	116	613	1000	
Cowtown	TEOM	PCAQCD	04-021-3013-81102-3	511	2178	1600	RJ
Sacaton	TEOM	GRIC	04-021-7001-81102-1	252	1139	0900	RJ
Casa Blanca	TEOM	GRIC	04-021-7004-81102-3	329	1314	1900	RJ
Santa Cruz County							
Nogales Post Office	**BAM**	**ADEQ**	**04-023-0004-81102-3**	**171**	**459**	**1600**	**RJ**
Yuma County							
Yuma Supersite	**TEOM**	**ADEQ**	**04-027-8011-81102-3**	**640**	**2768**	**1700**	**RJ**
California							
Imperial County							
Brawley-Main Street #2	BAM	ICAPCD	06-025-0007-85101-3	250	812	1700	
Niland-English Road	BAM	ICAPCD	06-025-4004-85101-3	296	920	1300	
Riverside County							
Torres-Martinez Admin Site	BAM	TMIR	06-065-1999-81102-1	250	980	1400	

BAM: Beta Attenuation Monitor
FMIR: Fort McDowell Indian Reservation
FRM: Federal Reference Method
GRAV: Gravimetric Analysis
GRIC: Gila River Indian Community
HIR: Hualapai Indian Reservation
ICAPCD: Imperial County Air Pollution Control District
IJ: Qualifier flag for high winds
MCAQD: Maricopa County Air Quality Department
MST: Mountain Standard Time
NNIR: Navajo Nation

NPS: National Park Service
PCAQCD: Pinal County Air Quality Control District
PCDEQ: Pima County Department of Environmental Quality
RJ: qualifier flag for high winds
SCAQMD: South Coast Air Quality Management District
SRPMIC: Salt River Pima-Maricopa Indian Community
TEOM: Tapered Element Oscillating Microbalance
TMIR: Torres-Martinez Indian Reservation
WMAT: White Mountain Apache Tribe

Table 2-2. PM_{10} measurements collected in Arizona on April 9, 2013. Monitors specific to this report with data that exceeded the NAAQS are shown in **bold green**.

Page 1 of 3

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg PM_{10} (µg/m^3)	1-hr Max PM_{10} µg/m^3)	Time of Max 1-hr PM_{10} (MST)	AQS Qualifier Flag
Arizona							
Apache County							
N/A	TEOM	WMAT	04-001-1003-81102-1	6	23	2000	
Cochise County							
Paul Spur Chemical Lime Plant	TEOM	ADEQ	04-003-0011-81102-3	80	186	0900	IJ
Douglas Red Cross	TEOM	ADEQ	04-003-1005-81102-3	92	260	1200	IJ
Gila County							
Hayden Old Jail	TEOM	ADEQ	04-007-1001-81102-3	55	191	0800	IJ
Miami Golf Course	TEOM	ADEQ	04-007-8000-81102-3	41	131	0300	
Maricopa County							
West Phoenix	BAM	MCAQD	04-013-0019-81102-1	62	355	0100	
Mesa	TEOM	MCAQD	04-013-1003-81102-1	38	122	0200	
North Phoenix	TEOM	MCAQD	04-013-1004-81102-1	33	107	0200	
Glendale	TEOM	MCAQD	04-013-2001-81102-1	49	281	0000	
Central Phoenix	TEOM	MCAQD	04-013-3002-81102-4	44	159	0200	
South Scottsdale	TEOM	MCAQD	04-013-3003-81102-1	30	85	0800	
Greenwood	TEOM	MCAQD	04-013-3010-81102-1	57	335	0000	
South Phoenix	TEOM	MCAQD	04-013-4003-81102-1	59	392	0000	
West Chandler	TEOM	MCAQD	04-013-4004-81102-1	40	133	0200	
Tempe	TEOM	MCAQD	04-013-4005-81102-1	32	125	0200	
Higley	TEOM	MCAQD	04-013-4006-81102-1	40	137	0200	
West 43rd Ave	TEOM	MCAQD	04-013-4009-81102-1	63	488	0000	
Dysart	TEOM	MCAQD	04-013-4010-81102-1	21	51	0000	
Buckeye	TEOM	MCAQD	04-013-4011-81102-1	36	105	0600	
Zuni Hills	TEOM	MCAQD	04-013-4016-81102-1	17	41	0000	
Fort McDowell/ Yuma Frank	TEOM	FMIR	04-013-5100-81102-3	34	97	0300	
St Johns	TEOM	GRIC	04-013-7003-81102-1	59	449	0000	

Table 2-2. PM_{10} measurements collected in Arizona on April 9, 2013. Monitors specific to this report with data that exceeded the NAAQS are shown in **bold green**.

Page 2 of 3

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg PM_{10} ($\mu g/m^3$)	1-hr Max PM_{10} $\mu g/m^3$)	Time of Max 1-hr PM_{10} (MST)	AQS Qualifier Flag
Maricopa County (continued)							
High School Air Monitoring Station	TEOM	SRPMIC	04-013-7024-81102-2	32	81	0800	
Durango Complex	TEOM	MCAQD	04-013-9812-81102-1	63	444	0000	
JLG Supersite	BAM	ADEQ	04-013-9997-81102-3	39	110	0200	
Mohave County							
Bullhead City	TEOM	ADEQ	04-015-1003-81102-3	13	25	0900	
Navajo County							
N/A	TEOM	WMAT	04-017-1002-81102-1	13	71	0500	
Pima County							
Ajo	TEOM	ADEQ	04-019-0001-81102-3	67	170	0000	
Orange Grove	GRAV	PCDEQ	04-019-0011-81102-2	142	N/A	N/A	
Rillito	**TEOM**	**ADEQ**	**04-019-0020-81102-3**	**201**	**718**	**0700**	**RJ**
South Tucson	**GRAV**	**PCDEQ**	**04-019-1001-81102-1**	**165**	**N/A**	**N/A**	**RJ**
Green Valley	**TEOM**	**PCDEQ**	**04-019-1030-81102-1**	**434**	**1552**	**0500**	**RJ**
Geronimo	**BAM**	**PCDEQ**	**04-019-1113-81102-1**	**188**	**995**	**0600**	**RJ**
Pinal County							
Casa Grande Downtown	TEOM	PCAQCD	04-021-0001-81102-3	67	204	0700	W
Apache Junction Fire Station	TEOM	PCAQCD	04-021-3002-81102-3	36	95	0900	
Pinal Air Park	TEOM	PCAQCD	04-021-3007-81102-3	127	519	0600	
Stanfield	TEOM	PCAQCD	04-021-3008-81102-3	105	351	0200	
Combs	TEOM	PCAQCD	04-021-3009-81102-3	39	131	0900	
Maricopa	TEOM	PCAQCD	04-021-3010-81102-3	85	367	0200	W
Cowtown	TEOM	PCAQCD	04-021-3013-81102-3	72	161	0200	
Sacaton	TEOM	GRIC	04-021-7001-81102-1	46	138	0200	
Casa Blanca	TEOM	GRIC	04-021-7004-81102-3	52	163	0100	
Santa Cruz County							
Nogales Post Office	**BAM**	**ADEQ**	**04-023-0004-81102-3**	**275**	**985**	**0700**	**RJ**
Yuma County							
Yuma Supersite	TEOM	ADEQ	04-027-8011-81102-3	66	110	1900	

Table 2-2. PM_{10} measurements collected in Arizona on April 9, 2013. Monitors specific to this report with data that exceeded the NAAQS are shown in **bold green**.

Page 3 of 3

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg PM_{10} ($\mu g/m^3$)	1-hr Max PM_{10} $\mu g/m^3$)	Time of Max 1-hr PM_{10} (MST)	AQS Qualifier Flag
California							
Imperial County							
Brawley-Main Street #2	BAM	ICAPCD	06-025-0007-85101-3	60	112	0200	
Niland-English Road	BAM	ICAPCD	06-025-4004-85101-3	48	104	0000	
Riverside County							
Torres-Martinez Admin Site	BAM	TMIR	06-065-1999-81102-1	59	172	0900	
San Bernardino County							
Upland	BAM	SCAQMD	06-071-1004-81102-3	33	60	0800	
San Bernardino-4th Street	TEOM	SCAQMD	06-071-9004-81102-3	31	66	1600	

W: qualifier flag for flow rate average out of specification.

2.2 Climate

Southern Arizona has an arid climate, with very hot summers and temperate winters. The average summer high temperatures are among the hottest of any populated area in the United States (**Figure 2-3**). Average high temperatures are generally in the high 90s to low 100s, and average annual rainfall ranges from just over 3 inches in the Yuma area in southwestern Arizona to approximately 15 inches in regions of southeastern Arizona. The bulk of this rain usually falls during December through March and July through September. During December through March, winter storms originating from the Pacific Ocean can produce significant rains in southern Arizona. During the mid- to late-summer period, monsoonal moisture originating from the Gulf of California, Gulf of Mexico, and large thunderstorm complexes over the Sierra Madre Occidental Mountains in Mexico move northward into Arizona.

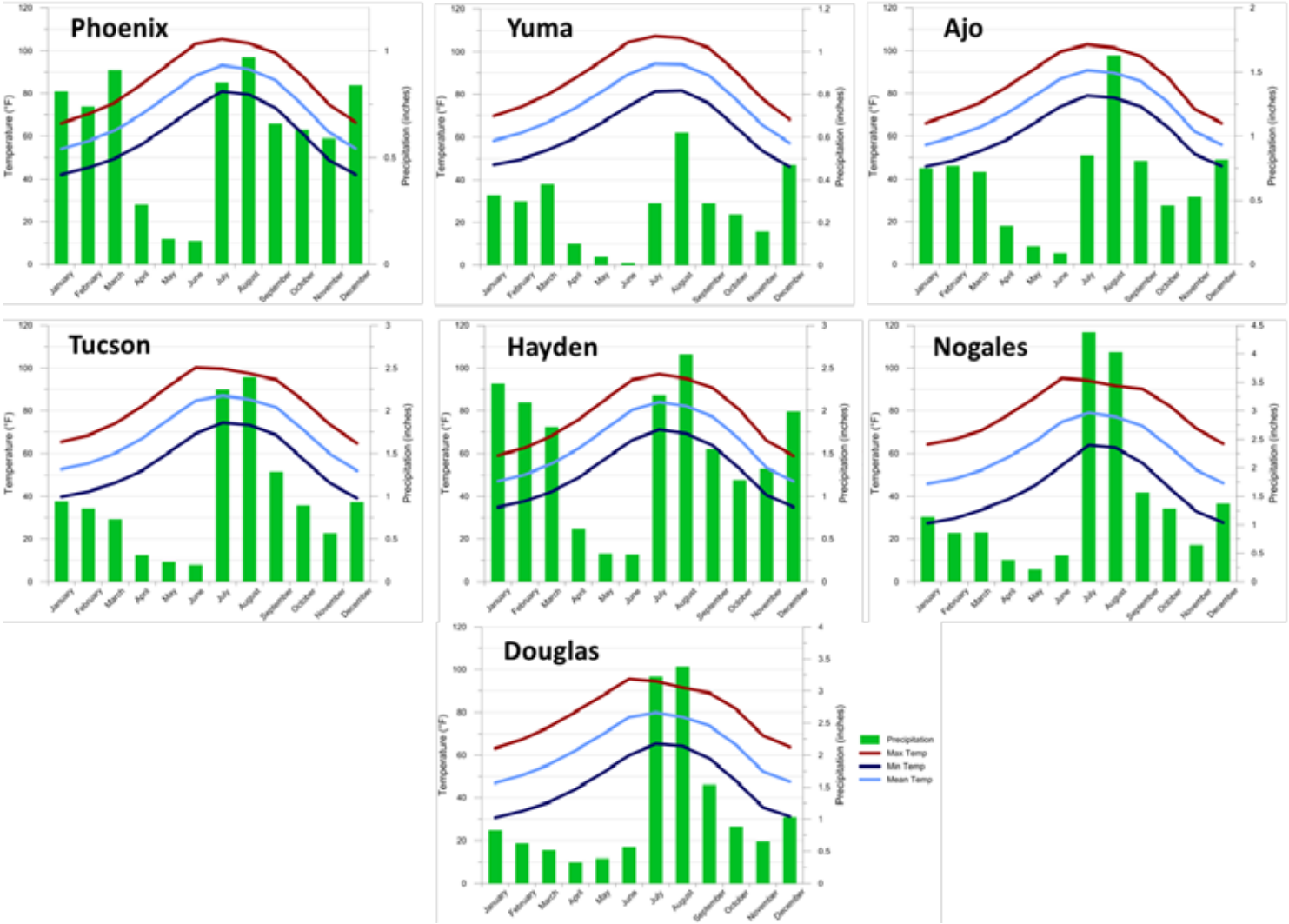

Figure 2-3. Average monthly temperatures and precipitation for Phoenix, 1981–2010; Yuma, 1981−2010; Ajo, 1981−2010; Tucson, 1981−2010 (closest NWS site to Rillito; Rillito is 20 miles northwest of Tucson); Hayden, 1981−2010; Nogales, 1952−2010; and Douglas, 1981−2010.

2.3 Background

2.3.1 Maricopa County (Phoenix)

Geographic Setting and Monitor Locations

The Maricopa County PM_{10} Nonattainment Area is centered on the City of Phoenix, located in the Salt River Valley in south-central Arizona. Phoenix lies at an elevation of 1,090 feet above mean sea level (msl) in the northeastern part of the Sonoran Desert. Other than the mountains in and around the city, the topography of Phoenix is generally flat. The Phoenix area is surrounded by the McDowell Mountains (~4,200 ft above msl) to the northeast, the foothills of the Bradshaw (~7,900 ft above msl) and Mazataal (~7,900 ft above msl) ranges to the north, the White Tank Mountains (~4,500 ft above msl) to the west, the Sierra Estrella (~4,450 ft above msl) to the southwest, and the Superstition Mountains (~5,000 ft above msl) far to the east. Within the City are the Phoenix Mountains (~2,600 ft above msl) and South Mountain (~2,600 ft above msl). Current development is pushing north, west, and south into Pinal County.

A fairly dense network of air quality and meteorological monitors exists throughout the Phoenix area. **Figure 2-4** shows the general geographic setting of Phoenix, as well as the locations of PM_{10} and meteorological monitors that were operational on April 8, 2013. PM_{10} exceedances were recorded at the West 43rd Ave, Buckeye, South Phoenix, West Chandler, Higley, Durango Complex, Greenwood, West Phoenix, Central Phoenix, Glendale, Zuni Hills, and JLG Supersite AQS monitors on April 8, 2013. Some of the AQS monitors in the Phoenix area are run by the Maricopa County Air Quality Department (MCAQD), while others are run by ADEQ. Many of the AQS sites collect collocated wind data. Seven NWS sites and eight Arizona Meteorological Network (AZMET) sites were also in operation near Phoenix during the April 8, 2013, dust event.

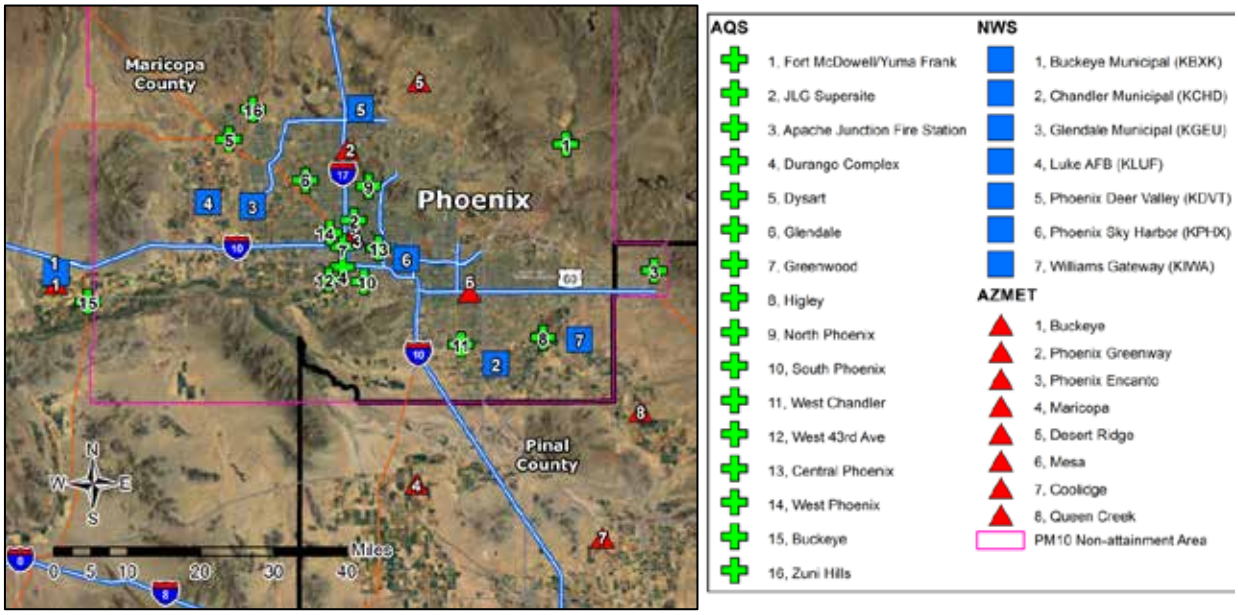

Figure 2-4. Air quality and meteorological monitors near Phoenix, Arizona.

Figure 2-5 depicts the drainage systems or watersheds for the State of Arizona. Many of the rivers that form Arizona's drainage system are dry for most of the year and, consequently, are sources of silt and fine soils that become suspended and add to regional PM_{10} loadings during high wind events. Much of this alluvial matter and fine soil is deposited in the low-lying areas of central and southern Arizona, with larger depositional areas focused in and around the confluences of dry river channels.

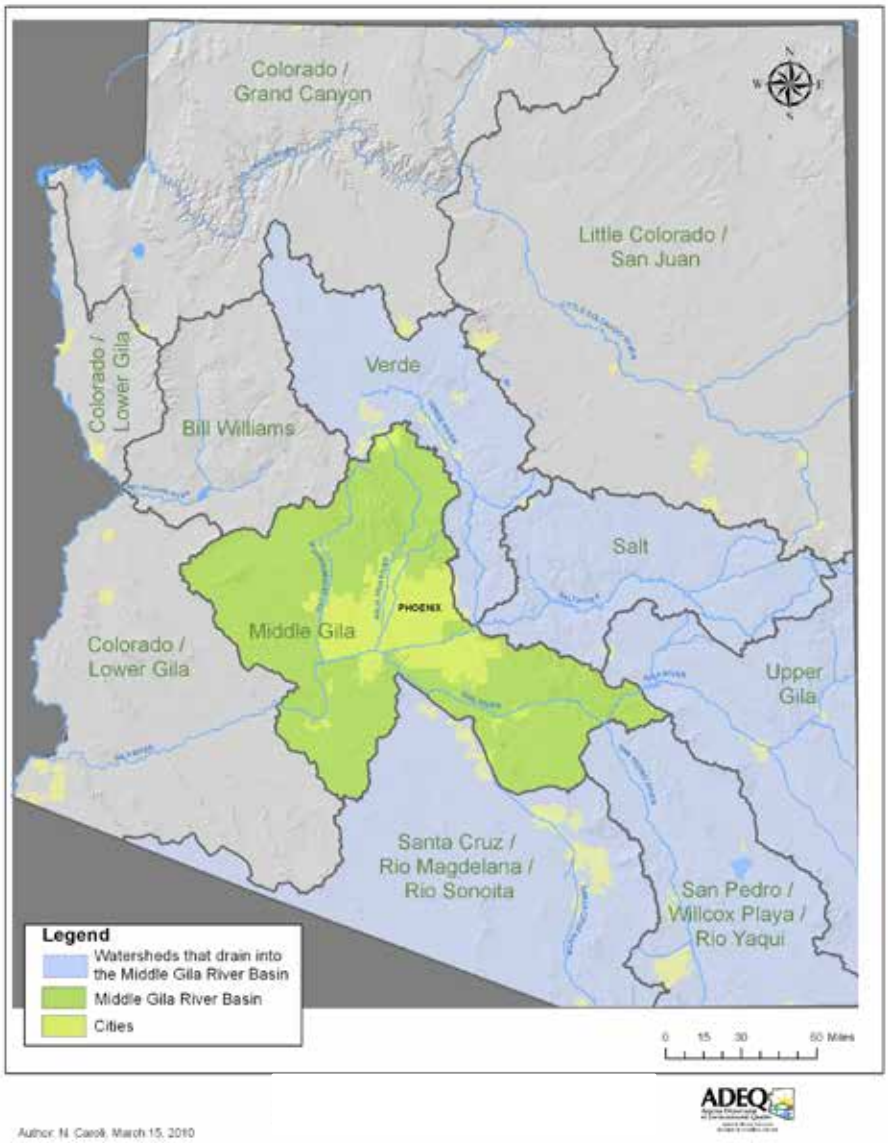

Figure 2-5. Drainage systems of the State of Arizona.

History of PM_{10} Attainment Status

The Maricopa County area was designated as a moderate PM_{10} nonattainment area by operation of the 1990 Clean Air Act (CAA) Amendments. On June 10, 1996, Maricopa County

was reclassified as a serious PM_{10} nonattainment area. The Maricopa Association of Governments (MAG) submitted the MAG 1999 Serious Area Particulate Plan for PM_{10} on July 9, 1999, addressing the 24-hour and annual PM_{10} standards. Subsequently, a revised state implementation plan (SIP) requesting an extension for PM_{10} attainment in the metropolitan Phoenix area by 2006 was submitted in February 2000. EPA approved the plan, extending the attainment date for both PM_{10} standards to December 31, 2006 (67 FR 48718, January 10, 2002). The Maricopa nonattainment area failed to attain the NAAQS by the December 31, 2006 deadline, despite the most stringent measures and best available control measures adopted and implemented in the area. As a result, the CAA required SIP revisions by December 31, 2007, providing for annual PM_{10} reductions of at least 5% until the NAAQS are met. MAG prepared the SIP revision and submitted it to EPA by the deadline.

2.3.2 Yuma

Geographic Setting and Monitor Locations

Yuma is located in the Sonoran Desert and Lower Colorado River Valley in extreme southwestern Arizona at an elevation of 138 feet above sea level. The Yuma Metropolitan Statistical Area is defined as Yuma County, which reported a population of 195,751 as of the 2010 census. Yuma County is bordered by Imperial County, California, to the north and northwest and by the Mexican state of Baja California to the west and south (**Figure 2-6**). Yuma lies just west of the confluence of the Colorado and Gila Rivers. Most of Yuma is located in the Colorado River Floodplain, commonly known as the Yuma Valley. The Yuma Valley follows the course of the Colorado River southward to the Sea of Cortez. Part of Yuma is built on the Yuma Mesa, a prominent land feature extending to the east of Yuma. The Gila Mountains, located roughly 15 to 20 miles east and southeast of Yuma, are a range of mountains with a peak elevation of 3,156 feet.

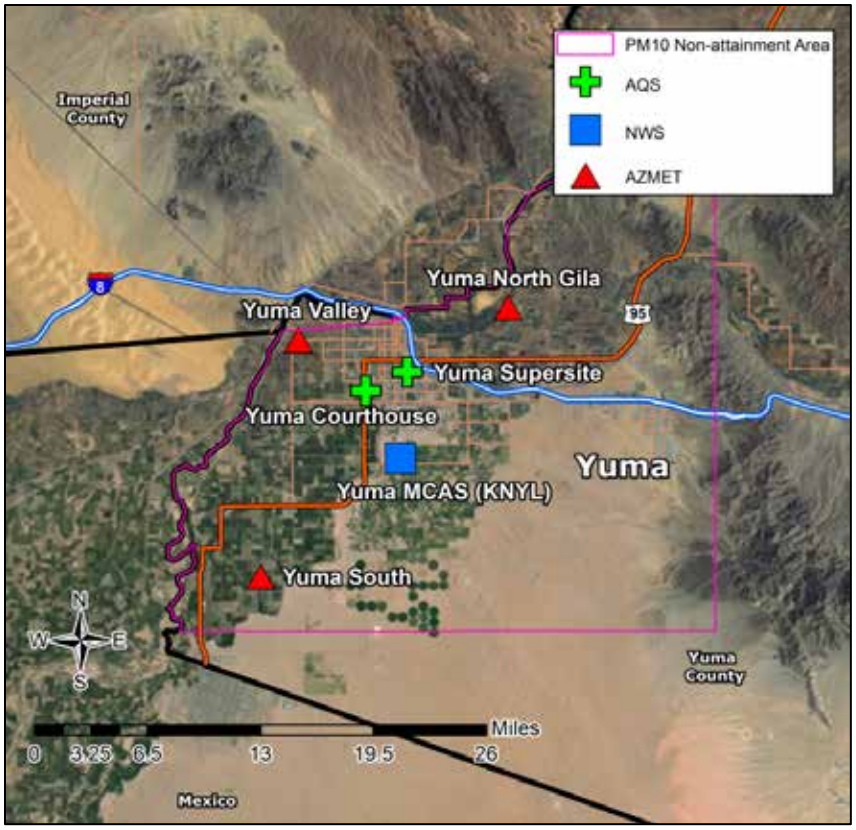

Figure 2-6. Air quality and meteorological monitors in the immediate Yuma region. Note: The Yuma Courthouse monitor is now inactive, but recorded PM_{10} prior to January 1, 2010.

The air quality and meteorological monitors located in the immediate Yuma area are shown in Figure 2-6. The PM_{10} exceedance on April 8, 2013, was recorded at the Yuma Supersite monitor, which is located in central Yuma and has been operational since January 1, 2010. The Yuma Courthouse monitor shown in Figure 2-6 is inactive, but measured PM_{10} prior to January 1, 2010. Data from the Yuma Courthouse monitor were used to supplement the Yuma Supersite data record for the Historical Norm section of this demonstration. Three AZMET sites are in operation in the Yuma area, located northeast, west, and southwest of the city. An NWS monitor is located at the Yuma Marine Corps Air Station (MCAS).

History of PM_{10} Attainment Status

The Yuma area was designated as a moderate PM_{10} nonattainment area by operation of the 1990 CAA Amendments. The area violated the 24-hour PM_{10} NAAQS in 1990 and 1991, and had violated the annual NAAQS in 1989 and 1990. ADEQ completed a SIP for the Yuma Moderate PM_{10} Nonattainment Area in 1991. Although the plan demonstrated attainment of the 24-hour and annual NAAQS through implementation of reasonably available control measures (RACM), EPA found the plan to be incomplete. ADEQ identified additional RACM being implemented in the Yuma area and updated the plan in 1994. Based on these additional control

measures, the 1994 plan demonstrated attainment of the PM_{10} NAAQS by an even greater margin. EPA has not approved the SIP for the Yuma area.

Since 1991, the Yuma area had not violated either the 24-hour or annual NAAQS up until 2002. As a result of several years of "clean data," and because the improvements in local air quality were permanent and enforceable, ADEQ began developing a maintenance plan and redesignation request for the Yuma area in 2001. ADEQ identified the various stakeholders in the Yuma area; these stakeholders include the local jurisdictions, the metropolitan planning organization, the agricultural community, federal agencies, two Native American tribes, a water users' association and irrigation districts, and the Arizona Department of Transportation. ADEQ began working with the stakeholders in July 2001 in developing the maintenance plan and redesignation request and continued to do so until an exceedance of the 24-hour NAAQS occurred in Yuma on August 18, 2002, as a result of a massive thunderstorm that generated strong winds and windblown dust.

High wind events are a type of natural event covered by EPA's Natural Events Policy (NEP). Under the NEP, ADEQ developed and submitted a Natural Events Action Plan (NEAP) to EPA on February 17, 2004. As a result of this exceedance, the maintenance plan was temporarily postponed until ADEQ completed a NEAP for the Yuma area. The NEAP contains strategies that are being implemented by the local jurisdictions in the Yuma area to reduce particulate matter in the event of future high wind conditions in the Yuma area.

The NEP states that best available control measures (BACM) must be implemented for controllable sources of PM_{10} within 3 years after the first NAAQS violation attributed to high wind events. Consequently, ADEQ completed a report on the implementation of the BACM contained in the Yuma NEAP. ADEQ submitted the NEAP implementation report to EPA on February 17, 2005.

2.3.3 Ajo

Geographic Setting and Monitor Locations

The Ajo Nonattainment Area (ANA) is located in western Pima County in southern Arizona, approximately 87 miles southeast of Phoenix and 114 miles west of Tucson. The ANA encompasses 47 square miles, roughly centered around the City of Ajo. The City of Ajo is located on State Route 85, roughly 43 miles north of the Arizona-Mexico border. Pima County consists predominantly of the Sonoran desert and mountainous terrain. The City of Ajo lies at an elevation of approximately 1,800 feet above sea level.

Mining and copper smelting have historically been economically important in the Ajo area. In 1986, the New Cornelia mine, operated by Phelps Dodge, was closed, and the population of Ajo subsequently declined significantly. As of the 2010 census, Ajo's population was 3,300.

ADEQ has operated one monitor in the ANA since 1986 (**Figure 2-7**). The PM_{10} exceedance on April 8, 2013, was recorded at this monitor. The purpose of the Ajo monitoring site is to monitor population exposure on a neighborhood scale. Data collection at the site

originally operated on a one-in-six day schedule. On April 1, 2009, the Ajo site began collecting PM_{10} measurements on a continuous hourly basis. Collocated wind data are available from the Ajo monitoring site. There are no official AZMET or NWS monitors in or near the ANA.

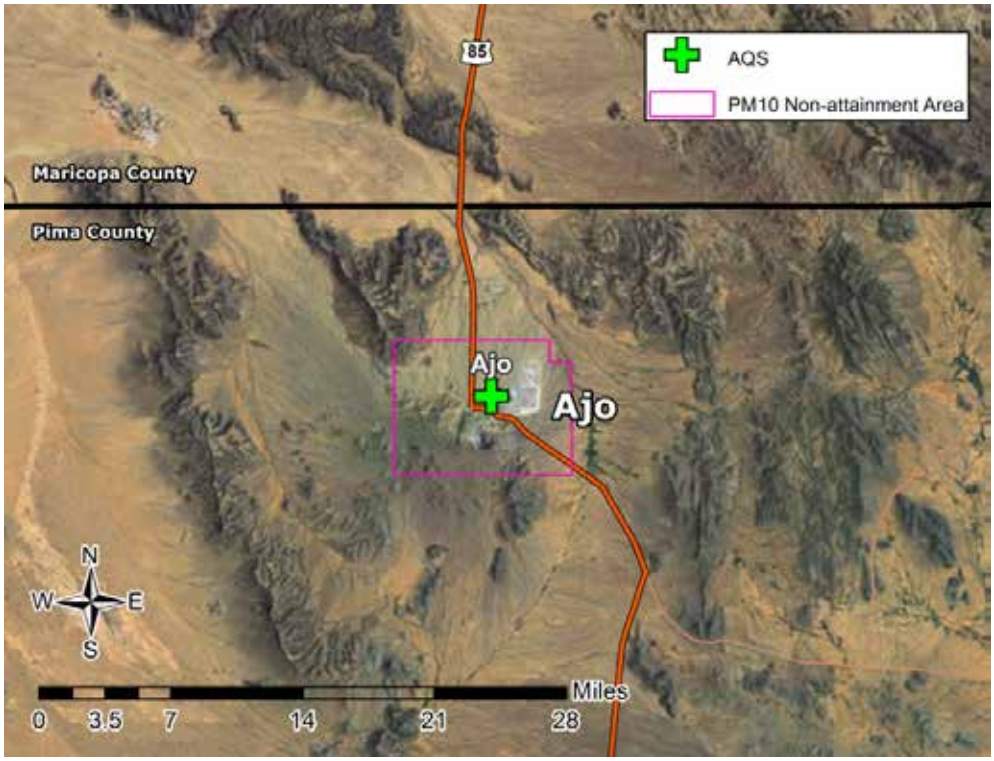

Figure 2-7. Air quality and meteorological monitors near the Ajo nonattainment area.

History of PM_{10} Attainment Status

The ANA was designated and classified as a moderate PM_{10} nonattainment area upon enactment of the 1990 CAA amendments, effective November 15, 1990. This action included requirements for submittal of an attainment demonstration and RACM implementation provisions by November 15, 1991, demonstrating that Ajo would be in attainment of the PM_{10} standards by December 31, 1994. ADEQ submitted a PM_{10} Moderate Nonattainment Area Attainment Demonstration for the ANA on November 14, 1991. EPA did not take further action on the 1991 plan.

No exceedances of the 24-hour PM_{10} NAAQS occurred in the ANA between 2002 and 2004. As a result, EPA determined that the ANA had met the PM_{10} NAAQS and, in 2006, issued a finding of attainment for the area (71 FR 6352, February 8, 2006). Based on this determination, certain CAA requirements are no longer applicable to the Ajo area as long as it continues to attain the PM_{10} NAAQS. The determination is not a redesignation to attainment, which is contingent on approval of a maintenance plan or determination that the area has met the other CAA requirements for redesignation.

2.3.4 Rillito/Pima County

Geographic Setting and Monitor Locations

Rillito is an unincorporated community in Pima County in southern Arizona, approximately 88 miles southeast of Phoenix and 20 miles northwest of Tucson. Rillito is bordered on all sides by the incorporated town of Marana. The region, along with much of southern Arizona, is in the Sonoran Desert. Rillito and Marana are flanked by the foothills of the Tortolita Mountains to the east, the Tucson Mountains to the south, and the Silver Bell Mountains to the west. Rillito and Marana lie at an elevation of approximately 1,900 feet above sea level, while peaks in each of the surrounding mountain ranges exceed 4,500 feet above sea level.

The Rillito Nonattainment Area (RNA) encompasses 324 square miles and nine townships. Much of the RNA comprises undeveloped land, and approximately 30% of the RNA consists of land cleared for agricultural purposes. Interstate 10 (I-10) traverses the northeastern corner of the RNA, and the Silver Bell copper mine is in the southwestern corner of the RNA. Saguaro National Park is south of the RNA.

Over the past 20 years, the RNA has undergone a transformation from a predominantly rural, agricultural area to an area of substantial population growth. The town of Marana has annexed large sections of the RNA and has grown from an estimated population of just over 2,000 in 1990 to over 30,000 in 2010. The population of Rillito has also grown during this period, but because of its very small geographic area, Rillito's population was only 97 as of 2010.

The air quality and meteorological monitors near Rillito are shown in **Figure 2-8**. The PM_{10} exceedances on April 8 and 9, 2013, were recorded at the Rillito monitor, which has been operational since 1985. In 2005, the monitor was moved to a new location less than 1,000 feet from its original location. The site is close to residential and industrial areas (chiefly, the CalPortland Cement plant). Collocated wind data are available from the Rillito monitor. There were no NWS or AZMET monitors in operation near the Rillito monitor during the April 8–9, 2013, dust event. The nearest NWS monitors, representative of regional weather conditions, are located in Tucson (about 15 to 20 miles to the southeast) and in Casa Grande (about 50 miles to the northwest).

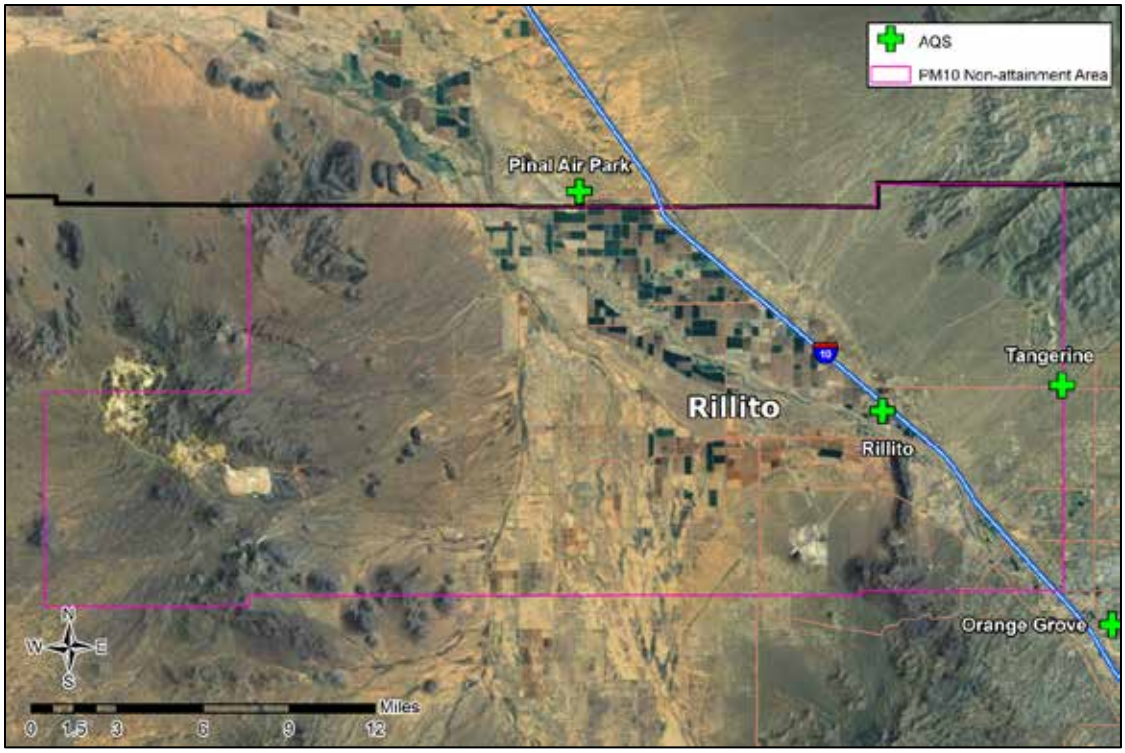

Figure 2-8. Air quality and meteorological monitors near the Rillito nonattainment area.

Recent analyses have determined that the I-10 corridor between Marana/Rillito and Casa Grande is particularly susceptible to dust storms and fatal traffic accidents due to the associated low visibilities.[2] These analyses identify this region as being particularly susceptible to dust storms because much of the land was originally used for agricultural purposes. That land has since largely been abandoned and allowed to revert to open desert. Desert soil that has been farmed and then abandoned in this manner takes a long time to recover. As a result of this change, there is a dearth of vegetation to hold down or catch blowing dust. Most of this land is located from Rillito northward into Pinal County.

History of PM_{10} Attainment Status

ADEQ began monitoring particulate matter in what is now the RNA in 1971. The original measurement standard for particulate matter, known as total suspended particulate matter (TSP), included a size range of particles collected by high-volume samplers (generally particles up to 40 microns in diameter). PM_{10} monitoring began in the RNA in 1985 on a sampling schedule of once every six days. Daily PM_{10} monitoring in the RNA began on April 1, 2010. In 1987, the EPA revised particulate matter standards to include only PM_{10} (52 FR 24634, July 1, 1987). As part of the implementation policy for the new standards, where insufficient observational PM_{10} data were available, EPA categorized areas of the country according to their probability of violating the standards: Group I areas were determined to have a high probability

[2] Several media outlets reported on the I-10 corridor dust storm analyses, including http://bit.ly/1gClpJq.

of violating the standards, Group II areas have a moderate probability of violating the standards, and Group III areas were unlikely to violate the standards.

EPA listed Rillito as a Group I area. As a result, the state of Arizona was required to submit a SIP within nine months of the promulgation of the NAAQS (52 FR 24672, July 1, 1987, and 52 FR 29383, August 7, 1987).

Prior to the state of Arizona's submission of a SIP, EPA updated its initial geographic descriptions for the Group I and Group II areas. Consistent with EPA's PM_{10} grouping scheme, the Rillito Group I Area was designated and classified as a moderate PM_{10} nonattainment area upon enactment of the 1990 CAA amendments, effective November 15, 1990. This action included requirements for submittal of an attainment demonstration and RACM implementation provisions by November 15, 1991.

ADEQ submitted a PM_{10} moderate nonattainment area attainment demonstration for the RNA on November 14, 1991. In a letter dated May 14, 1992, EPA found this plan to be incomplete because it lacked an emissions inventory. On April 22, 1994, ADEQ submitted a revised PM_{10} attainment plan for Rillito. In a letter dated August 18, 1994, EPA found the revised plan to be incomplete because of a lack of RACM. EPA has not taken further action on the 1994 PM_{10} plan.

No exceedances of the 24-hour PM_{10} NAAQS occurred in the RNA from 1990 through 2006. As a result, EPA determined that the RNA had met the PM_{10} NAAQS and issued a "clean data" finding for the area in 2006. Subsequently, ADEQ submitted to EPA a PM_{10} Limited Maintenance Plan (LMP) and a request for redesignation of the area to attainment. The LMP is a streamlined alternative to the reporting required under a regular Maintenance Plan.

2.3.5 Hayden and Miami

Geographic Setting and Monitor Locations

The Hayden Nonattainment Area (HNA) is located in Gila and Pinal counties in southern Arizona. Both desert terrain and mountain ranges are found across the southern Gila County and eastern Pinal County landscape. The City of Hayden is approximately 70 miles southeast of Phoenix and 55 miles north of Tucson, on State Highway 177. Elevations range from near 1,800 to more than 4,400 feet above sea level in the HNA, with the town of Hayden situated at an elevation near 2,050 feet.

A majority of the HNA is located in Pinal County. Populations grew in Gila and Pinal counties between 1970 and 2000, but decreased in the City of Hayden during that time due to declining mining sector employment and associated activities. Minimal population growth is projected out to 2015 for the City of Hayden.

The air quality and meteorological monitors near Hayden, Arizona, are shown in **Figure 2-9**. The PM_{10} exceedance on April 8, 2013, was recorded at the Hayden Old Jail monitor. This monitor was established in 1985 to perform source-oriented monitoring on a neighborhood scale, and originally operated on a one-in-six day schedule. On December 22,

2005, continuous hourly measurement collection began at the Hayden Old Jail monitor. Collocated wind data are also available from the Hayden Old Jail monitoring site; however, there are no official AZMET or NWS monitors in the immediate vicinity of Hayden.

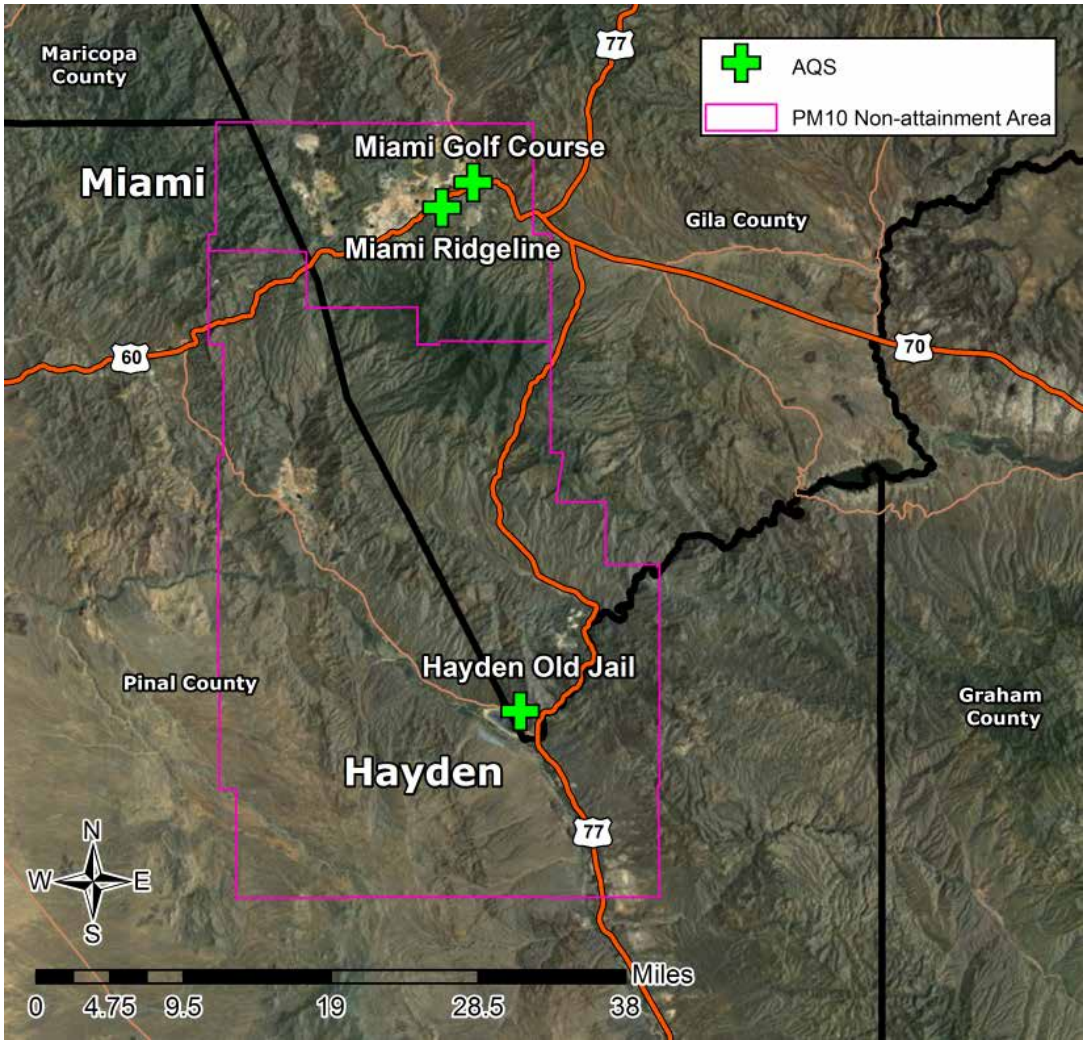

Figure 2-9. Air quality and meteorological monitoring sites near Hayden, Arizona.

History of PM_{10} Attainment Status

In 1979, two townships (one each in the Hayden and Miami areas) were designated as nonattainment areas for TSP. In 1987, the EPA revised particulate matter standards to include only PM_{10} (52 FR 24634, July 1, 1987). EPA listed the Hayden-Miami area as a Group I area. As a result, the state of Arizona was required to submit a SIP within nine months of the promulgation of the NAAQS (52 FR 24672, July 1, 1987, and 52 FR 29383, August 7, 1987).

EPA updated the original geographic descriptions for Group I and Group II areas in 1990. Under the new designation set by the CAA amendments, all 26 contiguous townships

around the towns of Hayden and Miami were included in the Hayden-Miami Group I area, and the area was classified as a moderate PM_{10} nonattainment area. The classification required submittal of an attainment demonstration and RACM implementation provisions by November 15, 1991.

ADEQ submitted a SIP for the Hayden-Miami Group I area in September, 1989. EPA proposed a limited approval/disapproval in July 1994, because the plan only addressed the Hayden portion of the nonattainment area. ADEQ subsequently submitted a petition to exclude the Miami area from the Hayden-Miami nonattainment area in November 1994, on the basis of topographical and climatological differences between the Hayden and Miami areas and a PM_{10} exceedance record in Miami that had been clean since monitoring began there in 1987. Due to past exceedances of the TSP standards in Miami and failure to meet the 1990 PM_{10} nonattainment designation criteria, EPA's response was that the Miami portion of the Hayden-Miami nonattainment area could not be excluded from the nonattainment status.

In July 2006, ADEQ requested that the Hayden-Miami nonattainment area be divided into two nonattainment areas. EPA concurred with the request on March 28, 2007, at which point the Hayden-Miami PM_{10} nonattainment area was officially divided into two separate nonattainment areas. In the same finding, EPA issued a clean data finding for the Miami area, relieving the state from certain demonstrations of attainment. In 2011, EPA determined that the HNA attained the PM_{10} NAAQS by the December 31, 1994, deadline and therefore was not subject to reclassification by operation of law to the "serious" classification (76 FR 1532, January 11, 2011).

2.3.6 Nogales

Geographic Setting and Monitor Locations

The Nogales Nonattainment Area (NNA) is located in Santa Cruz County in southern Arizona, approximately 66 miles south of Tucson. The NNA encompasses 76 square miles, including the City of Nogales, parts of the unincorporated community Rio Rico, and some unincorporated areas of Santa Cruz County. The region, along with much of southern Arizona, is in the Sonoran Desert. Located in a valley created by the Nogales Wash River, Nogales is flanked by the Patagonia Mountains to the east, the Santa Rita Mountains and Madera Canyon in the Coronado National Forest to the north, and the Tumacacori, Atascosa, and Pajarito mountains to the west. The NNA is bordered to the south by the Nogales, Sonora, Mexico, region, located just on the other side of the international Arizona-Mexico border. Nogales, Arizona, lies at an elevation of approximately 3,900 feet above sea level, while the mean elevation in Nogales, Sonora, Mexico, to the south is approximately 4,300 feet above sea level.

The population of the City of Nogales has remained fairly constant from 1990 to 2010, with an estimated population of approximately 21,000 in 2010. Meanwhile, the population of Santa Cruz County grew from nearly 30,000 in 1990 to nearly 44,000 in 2010. The southern portion of Rio Rico that is encompassed by the NNA had a population of roughly 4,000 in 2010. The population of nearby Nogales Municipality in Sonora, Mexico, was over 220,000 as of 2010.

The air quality and meteorological monitors near Nogales, Arizona are shown in **Figure 2-10**. The PM_{10} exceedances on April 8 and 9, 2013, were recorded at the Nogales Post Office monitoring site. ADEQ operates two PM_{10} monitors at this site, including a filter-based monitor that has operated on a one-in-six day schedule since 1985, and a continuous monitor that has operated since 2004. The Nogales Post Office site location was chosen as it is representative of the highest PM_{10} concentrations in the NNA. Collocated wind data have been collected at the site since June 2003. One NWS monitor was in operation near the Nogales Post Office monitor during the April 8 and 9, 2013, dust event. There are no official AZMET monitors in the immediate vicinity of Nogales.

Figure 2-10. Air quality and meteorological monitors near Nogales, Arizona.

History of PM_{10} Attainment Status

ADEQ began monitoring particulate matter in what is now the NNA in 1985. EPA listed Nogales as a Group II area with a moderate likelihood of violating the PM_{10} NAAQS. As a result, the state of Arizona was required to submit a SIP within three years of the promulgation of the NAAQS (52 FR 24672, July 1, 1987, and 52 FR 29383, August 7, 1987).

In 1990, amendments to the CAA-designated areas where violations of the PM_{10} standard had been recorded prior to January 1, 1989 (including former Group II PM_{10} planning areas) as non-attainment areas (55 FR 45799; October 31, 1990). On March 15, 1991, EPA published a list of non-attainment areas that included the NNA (56 FR 11101; March 15, 1991). As a result, Arizona was required to submit a SIP for the NNA by November 15, 1991, that demonstrated attainment of the PM_{10} NAAQS by December 31, 1994. Arizona did not submit a SIP for NNA by the November 15, 1991, deadline, and EPA documented the failure to submit a PM_{10} SIP on December 16, 1991.

On June 14, 1993, Arizona submitted a PM_{10} SIP for the NNA. In a letter dated November 30, 1993, EPA found the plan to be complete but did not act on the plan. On January 11, 2011, EPA retroactively affirmed that the NNA had met the PM_{10} NAAQS by December 31, 1994, based on air quality monitoring data from 1992–1994 (76 FR 1532, January 11, 2011). The NNA continued to meet the PM_{10} NAAQS until 1998. Since 1998, intermittent exceedances have been recorded by both the filter-based and continuous monitors. ADEQ submitted an updated SIP for the NNA on July 23, 2012. EPA approved the 2012 NNA PM_{10} SIP in October 2012, approving the demonstration that the NNA is attaining the NAAQS but for international emissions sources in Nogales, Mexico (77 FR 58962, October 25, 2012).

2.3.7 Douglas

Geographic Setting and Monitor Locations

The Douglas Nonattainment Area (DNA) is located in Cochise County in southeastern Arizona on the international border with Mexico. The DNA includes the City of Douglas, the community of Pirtleville, and an unincorporated portion of Cochise County. The City of Douglas is adjacent to Agua Prieta, Sonora, Mexico, approximately 117 miles southeast of Tucson. Located toward the upper end of the Sulphur Springs Valley, Douglas is at an elevation of nearly 4,000 feet. The immediate terrain is flat, but ringed from the east to south to west by mountains.

Agriculture and ranching are important components of the area's economy. Given its location on the United States-Mexico border, Douglas is a major gateway to north-central Mexico. Consequently, international commerce is an important facet of the local economy. Manufacturing accounts for 24% of the Douglas area employment. Garments, electronic manufacturers, food processing firms, food packing, and printing industries are located in the Douglas area. According to the U.S. Census, as of 2010, the population of Douglas was roughly 17,000; Cochise County was 130,000; and Agua Prieta, Mexico, was 79,000.

The air quality and meteorological monitors near Douglas, Arizona are shown in **Figure 2-11**. The PM_{10} exceedance on April 8, 2013, was recorded at the Douglas Red Cross monitor, which has been operational since 1998. PM_{10} monitoring began in the Douglas area at the Douglas City Park monitor in March 1985. The City Park monitor was located in a central location in the Douglas community and was considered to be generally representative of public exposure to PM_{10}. In January 1997, the monitor was moved to Douglas High School, less than 1,000 feet from its original location. In 1998, the monitor was moved once more to a location less than 1,000 feet from Douglas High School and roughly 200 feet from the original Douglas

City Park site, and was renamed as the Douglas Red Cross monitor. Data collection at Douglas Red Cross began on a 24-hr, one-in-six day schedule until January 1, 2013, when continuous hourly monitoring began. Collocated wind data are available from the Douglas Red Cross monitor. One NWS monitor was in operation near the Douglas Red Cross monitor during the April 8, 2013, dust event. There are no official AZMET monitors in the immediate vicinity of Douglas.

Figure 2-11. Air quality and meteorological monitors near Douglas, Arizona.

History of PM_{10} Attainment Status

ADEQ began monitoring particulate matter in what is now the DNA in March 1985. The Douglas-Paul Spur Area (originally classified as a Group I area) was designated and classified as a moderate PM_{10} nonattainment area as a result of monitoring violations of the PM_{10} NAAQS.

Section 189 of the CAA Amendments required the State to submit a plan for all moderate PM_{10} nonattainment areas to the EPA by November 15, 1991. This action included requirements for submittal of an attainment demonstration and RACM implementation provisions. ADEQ failed to meet this deadline, but the amendments gave states 18 months after official notification from EPA to address SIP deficiencies. ADEQ submitted a PM_{10} nonattainment area SIP for the Douglas area in April 1993. The EPA found the Douglas SIP to be complete. On January 11, 2011, the EPA Region IX issued a Clean Data Finding for the

Douglas-Paul Spur Nonattainment Area based on ambient monitoring data from 1992–1994 that demonstrated that the area reached attainment of the PM_{10} NAAQS by the deadline established by the CAA Amendments (76 FR 1532, January 11, 2011). In 2012, EPA issued another Clean Data Finding for the DNA based on ambient air monitoring data for the years 2009–2011 (77 FR 149, August 2, 2012).

3. Causal Relationship

3.1 Overview

The windblown dust event on April 8–9, 2013, consisted of widespread strong winds, low visibilities, and high PM_{10} concentrations across Arizona and southeastern California. The windblown dust affected multiple PM_{10} nonattainment areas in Arizona. Because the individual PM_{10} exceedances were related to the same cold frontal system and the associated strong winds and blowing dust, this section of the report covers all of the PM_{10} nonattainment areas together, instead of separating them into individual discussions. Below is a general chronology of the event. Specific details regarding the event follow in Section 3.2.

1. A strong upper-level trough of low pressure and an associated cold front generated widespread strong southwesterly winds across southern Arizona, beginning during the morning hours on April 8. The strong winds lofted and transported dust across the state.
2. As the cold front moved across Arizona, winds shifted to westerly or northwesterly. In some areas, such as Yuma, PM_{10} concentrations peaked behind the cold front, because west-northwesterly winds are especially favorable for dust transport into Yuma. PM_{10} concentration in other areas, such as Phoenix, decreased behind the cold front, likely due to terrain blocking and light rain showers.
3. A large dust plume that was lofted by the high winds on April 8 in southeastern California, southwestern Arizona, and far northwestern Mexico, moved eastward into southeastern Arizona early on April 9 following passage of the cold front. Lighter winds behind the front left this dust suspended in the lower atmosphere, resulting in continued high PM_{10} concentrations and exceedances at the Rillito, Green Valley, Geronimo, South Tucson, and Nogales monitors.

3.2 Discussion

Meteorological and air quality observations indicate that dust lofted and carried by strong southwesterly winds generated by an approaching upper-level trough of low pressure (**Figure 3-1**) and cold front (**Figure 3-2**) was directly responsible for the high PM_{10} concentrations observed at monitors throughout southern Arizona on April 8. Some of the dust lofted by the strong winds on April 8 remained suspended in the lower atmosphere into the morning hours on April 9, and resulted in continued high PM_{10} concentrations at some monitors. The likely source regions for PM_{10} during the April 8–9, 2013, event were the vast, open regions of the Sonoran Desert of southern Arizona and northwestern Mexico. The last time before this event that widespread precipitation fell across southern Arizona was on March 8, 2013; that precipitation was associated with a cold front moving through the region. Light rain did fall across southern Arizona in association with the April 8–9, 2013, cold front, but the rain fell after the period of strong winds and high PM_{10} concentrations. Thus, the combination of geography and dry conditions preceding the event made the surface soils particularly susceptible to lofting by strong winds.

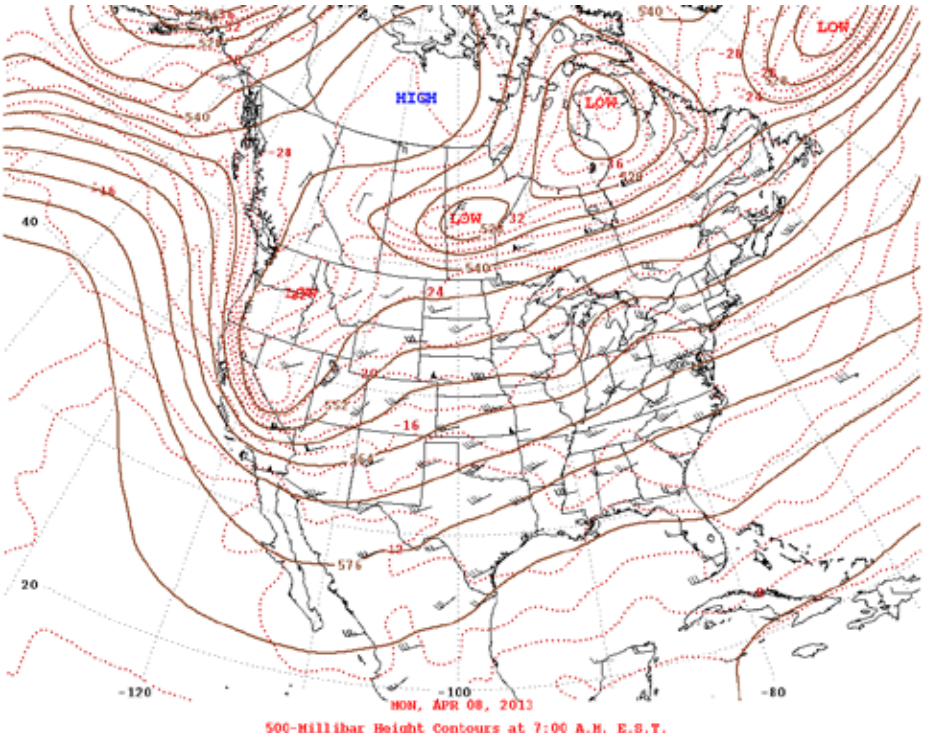

Figure 3-1. 500 mb geopotential height map for 05:00 MST on April 8, 2013. A strong upper-level trough of low pressure was located over California, moving southeast toward Arizona.

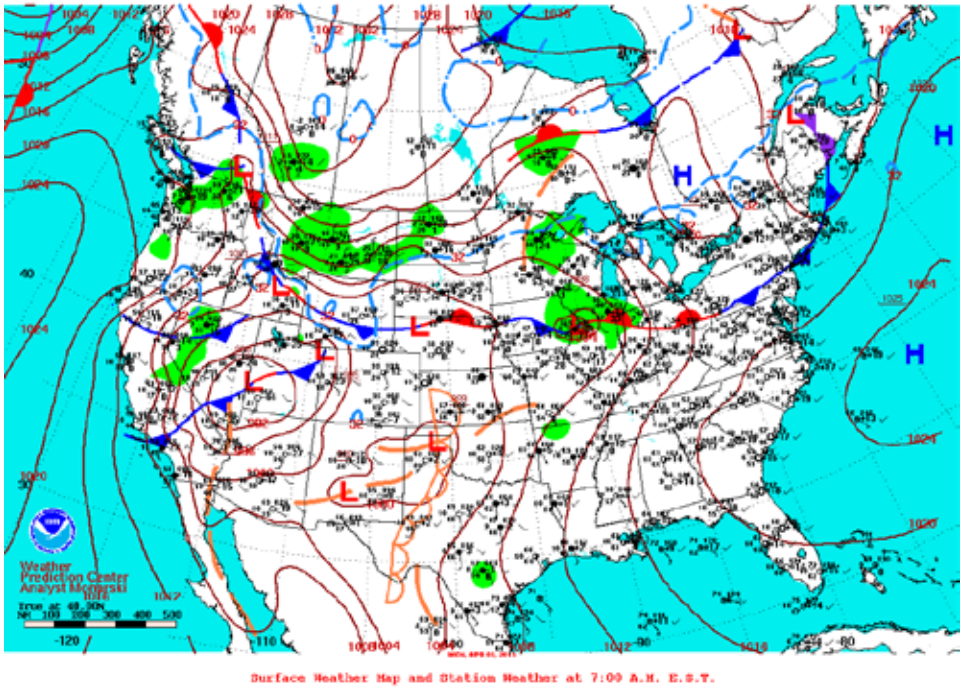

Figure 3-2. Surface weather map for 05:00 MST on April 8, 2013. A strong cold front was located over southern Nevada and southern California (blue line), moving southeast toward Arizona.

3.3 Strong Winds on April 8, 2013

The cold front produced a several hour period of strong southwesterly winds regionwide as the front swept eastward across southern California and Arizona. Numerous monitors clearly showed an increase in wind speeds, wind gusts, and PM_{10} concentrations as the front approached. As an example, **Figure 3-3** shows a time series of PM_{10} data at the Zuni Hills monitor and wind speed data at Luke Air Force Base (AFB), where 1-hr PM_{10} concentrations of over 600 µg/m^3, wind speeds of over 30 mph, and wind gusts of over 40 mph were reported. Visibilities also decreased at regional airports during the period of strong winds and high PM_{10} concentrations (**Figure 3-4**). Appendix A contains time series of PM_{10}, wind, and visibility data at the other monitors across Arizona for April 8 and 9, 2013, and hourly weather observations from airports. Several airports reported blowing dust, dust storm conditions, or haze during this event. The NWS offices in Phoenix and Tucson issued Wind Advisories and Blowing Dust Advisories for all of southern Arizona and southeastern California due to the strong winds and blowing dust associated with this event, and the widespread blowing dust over the southwestern United States was included in the National Oceanic and Atmospheric Administration's (NOAA) daily smoke/dust discussion (Appendix D). Numerous traffic accidents occurred along I-10 between Phoenix and Tucson due to near zero visibility in the blowing dust. Visibility cameras in Phoenix also clearly depicted the widespread nature of this event. Links to media stories and visibility camera video are listed in Appendix B. The dust was even visible on satellite imagery over southeastern California and southwestern Arizona (**Figure 3-5**). This dust plume moved eastward through the Yuma and Ajo areas on April 8 and into southeastern Arizona early on April 9.

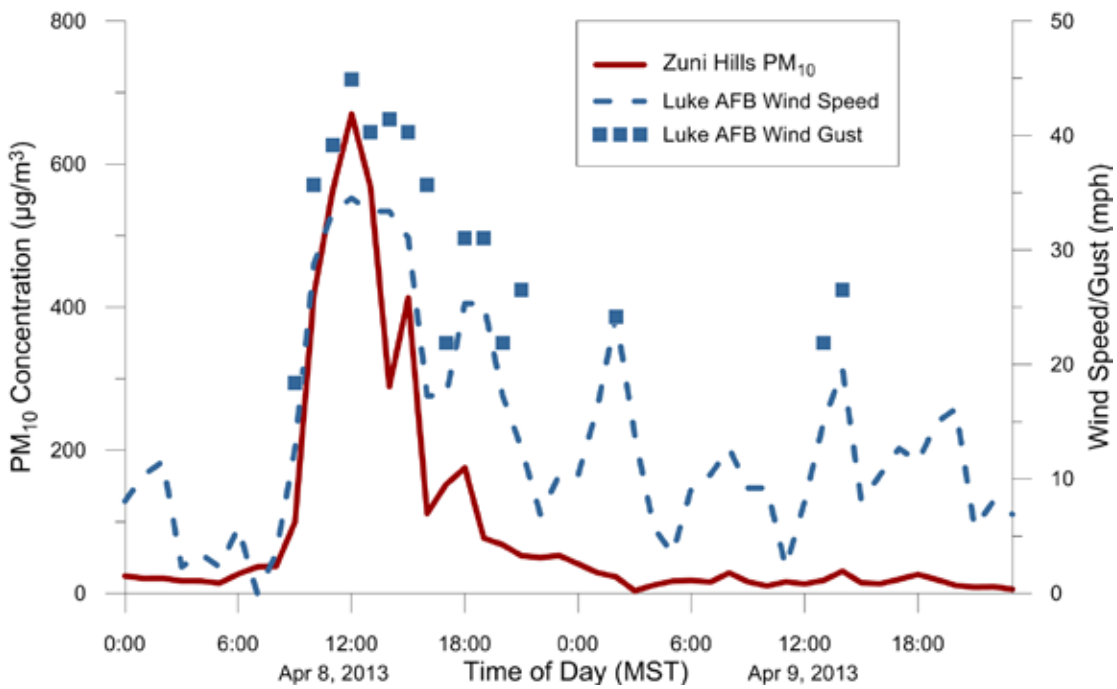

Figure 3-3. Hourly PM_{10} concentrations at the Zuni Hills monitor and wind speeds at Luke AFB Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 10:00 MST on April 8, indicating the presence of windblown dust.

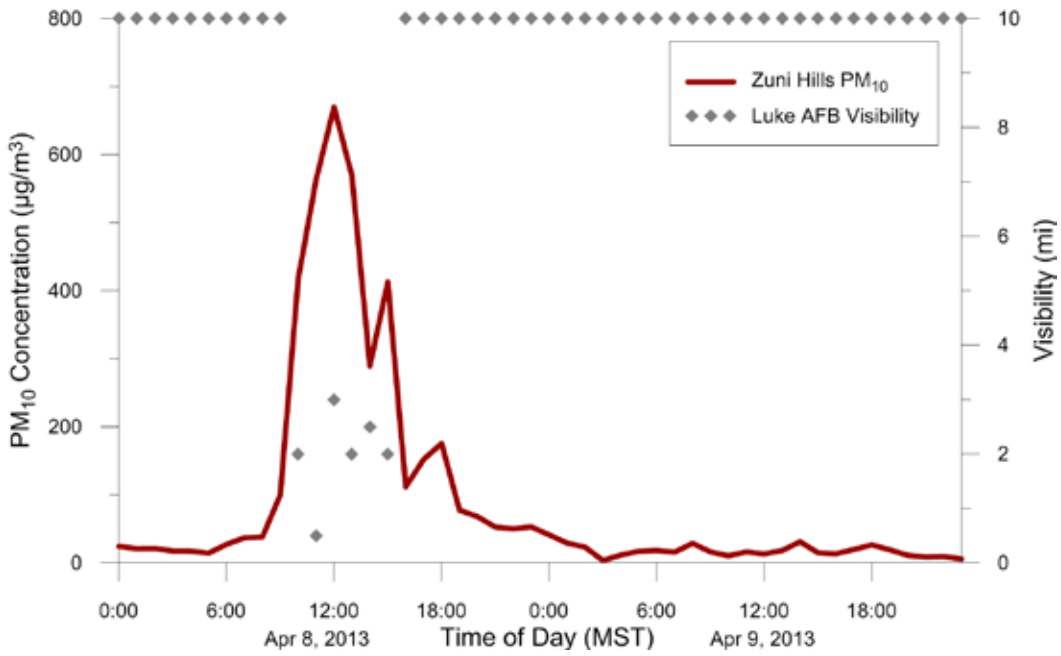

Figure 3-4. Hourly PM_{10} concentrations at the Zuni Hills monitor and visibilities at Luke AFB Airport on April 8 and 9, 2013. High PM_{10} concentrations and low visibilities were reported during the late morning and afternoon hours on April 8, indicating the presence of windblown dust.

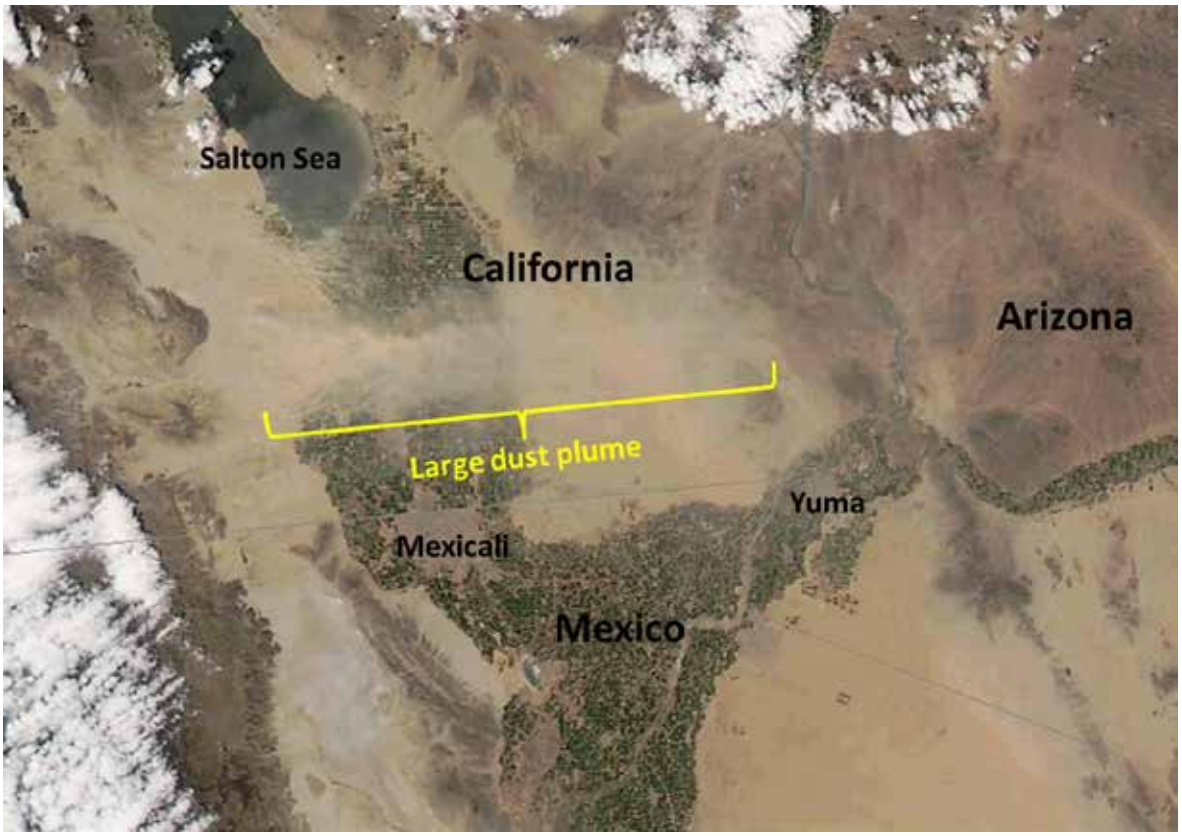

Figure 3-5. MODIS image from about 13:40 MST on April 8, 2013. A large dust plume was present over southeastern California, moving east.

Figures 3-6 through 3-17 show wind speeds of at least 5 mph (black arrows), wind gusts of at least 20 mph (red numbers), visibilities in miles (white numbers), and hourly PM_{10} concentrations (colored circles) across southeastern California and southern Arizona every two hours from 04:00 to 23:00 MST on April 8, representing periods before, during, and after the passage of the cold front. Radar reflectivity data from the Yuma, Phoenix, and Tucson NWS Doppler radars are also shown to illustrate areas of precipitation.

At 04:00 MST on April 8 (Figure 3-6), winds were generally light, PM_{10} concentrations were low, and visibilities were high throughout southern Arizona. The cold front was still located over central and southern California. Stronger winds ahead of the front were already developing in Imperial County, California. At 06:00 MST (Figure 3-7), wind speeds continued to increase in Imperial County, with sustained winds exceeding 30 mph and wind gusts exceeding 40 mph. PM_{10} concentrations exceeded 500 µg/m^3 in response to the strong winds. Southerly winds also started to increase throughout southern Arizona at this time, including wind gusts of up to 32 mph at Ajo. This trend continued during the 08:00 MST (Figure 3-8) and 10:00 MST (Figure 3-9) hours, as monitors measured widespread sustained winds of over 25 mph and wind gusts of over 35 mph. Visibilities decreased to less than 2 miles at some airport monitors in California, and PM_{10} concentrations increased to more than 500 µg/m^3 at several air quality monitors in both California and Arizona. At 10:00 MST, the cold front responsible for the strong winds was moving through far southeastern California (denoted by the blue line on Figure 3-9).

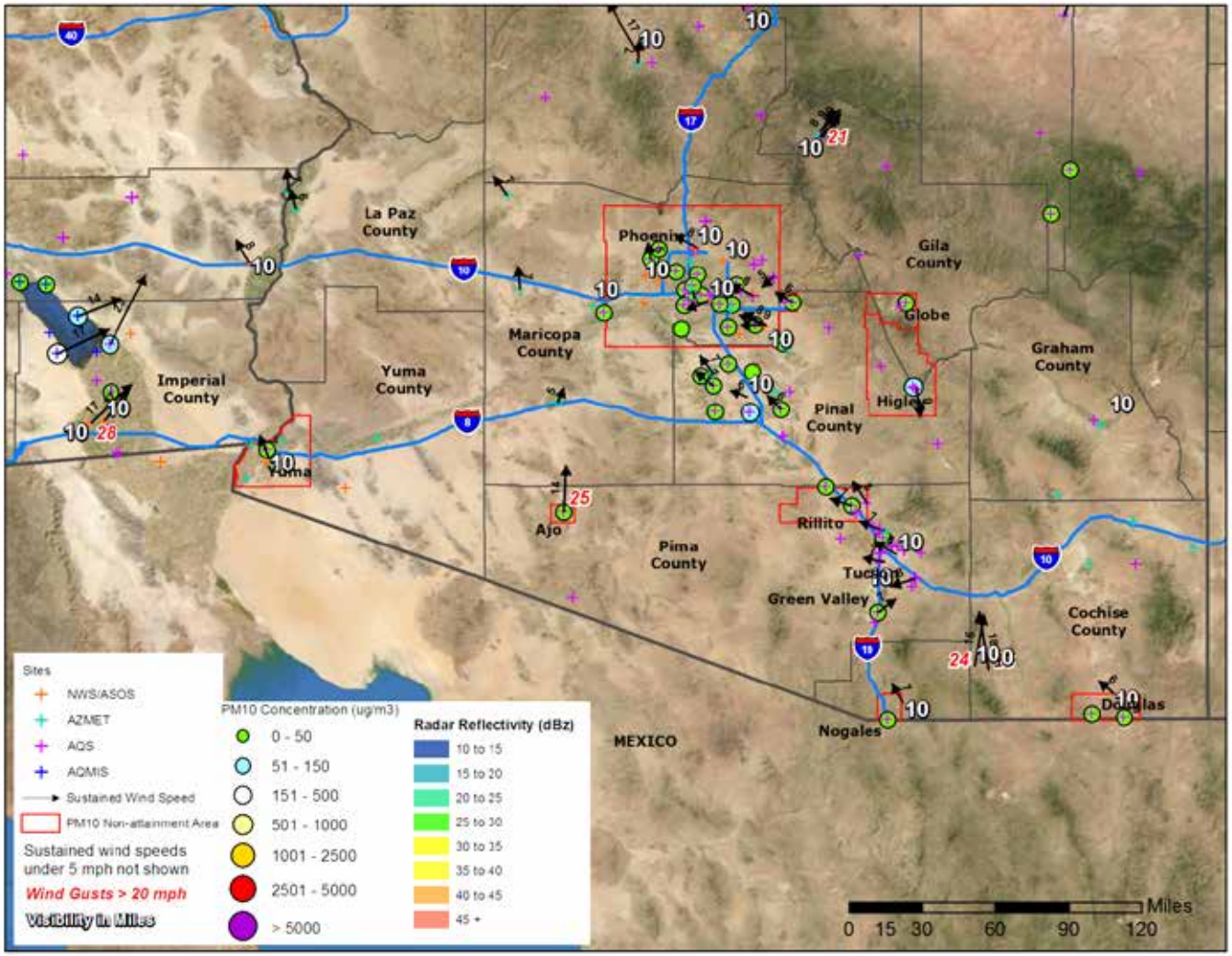

Figure 3-6. Meteorological and air quality data between 04:00 MST and 05:00 MST on April 8, 2013. Strong winds ahead of the approaching cold front were developing in Imperial County, California.

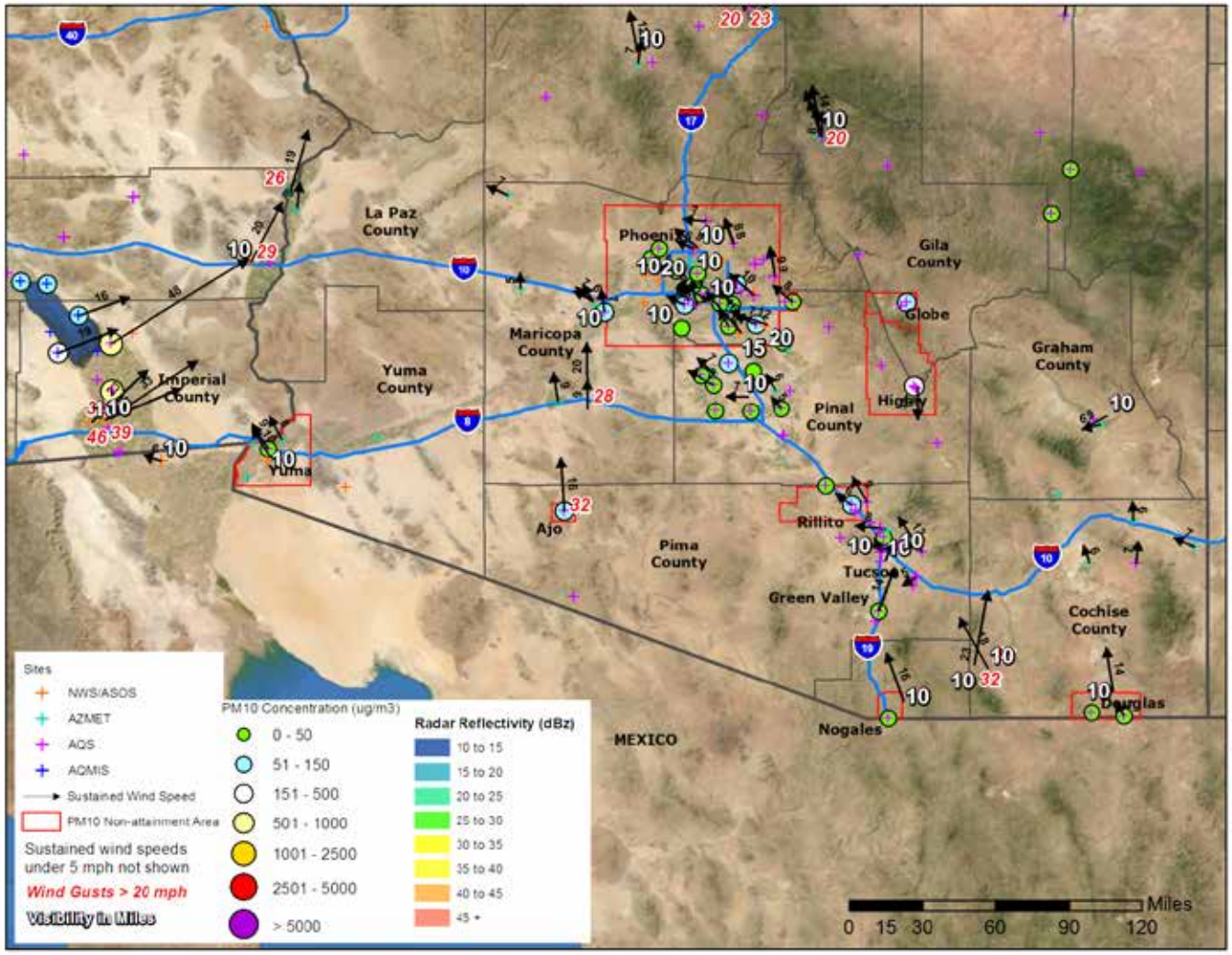

Figure 3-7. Meteorological and air quality data between 06:00 MST and 07:00 MST on April 8, 2013. Strong winds and high PM_{10} concentrations were reported in Imperial County. Gusty southerly winds developed at some monitors in Arizona.

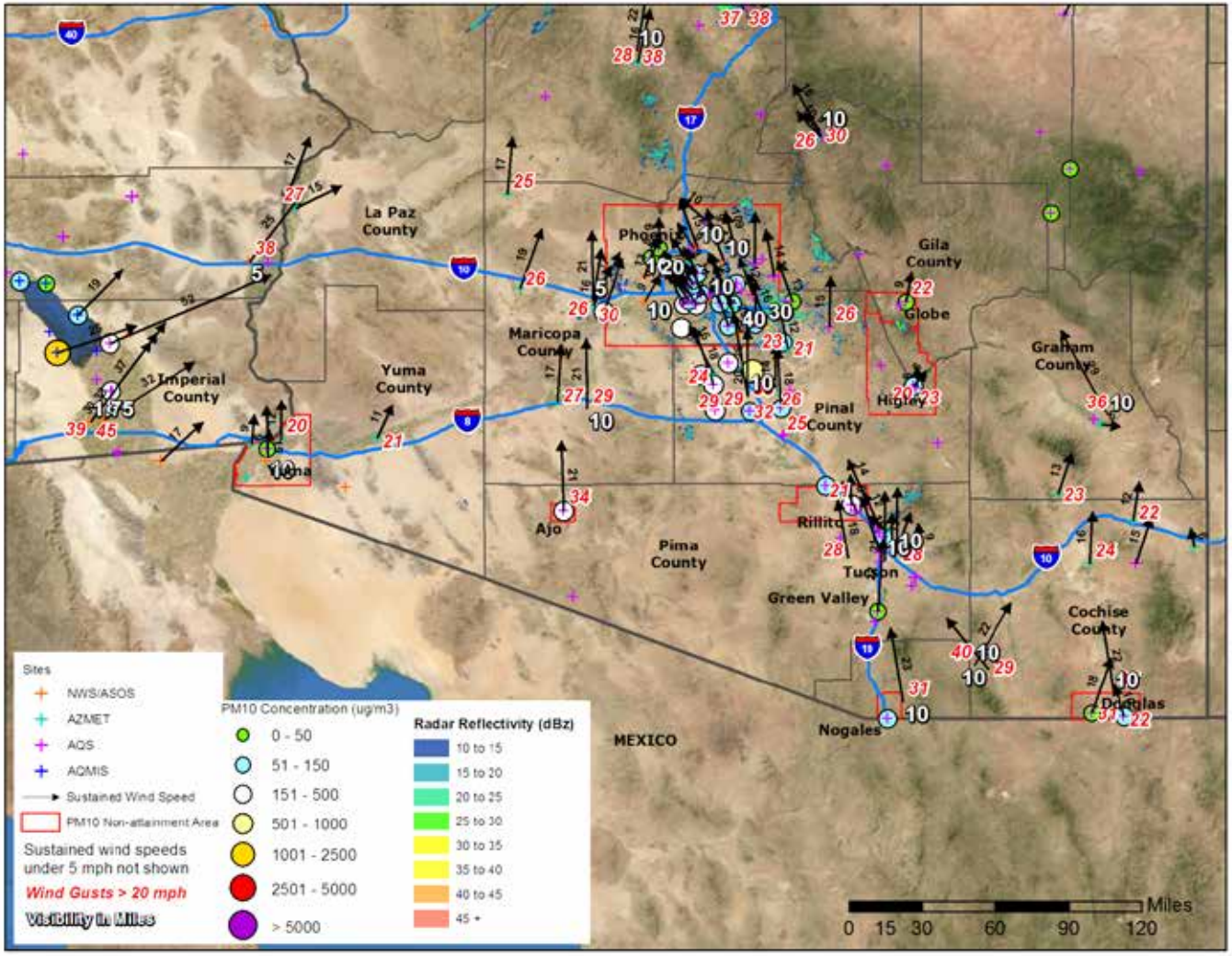

Figure 3-8. Meteorological and air quality data between 08:00 MST and 09:00 MST on April 8, 2013. Wind speeds and PM_{10} concentrations increased across Arizona.

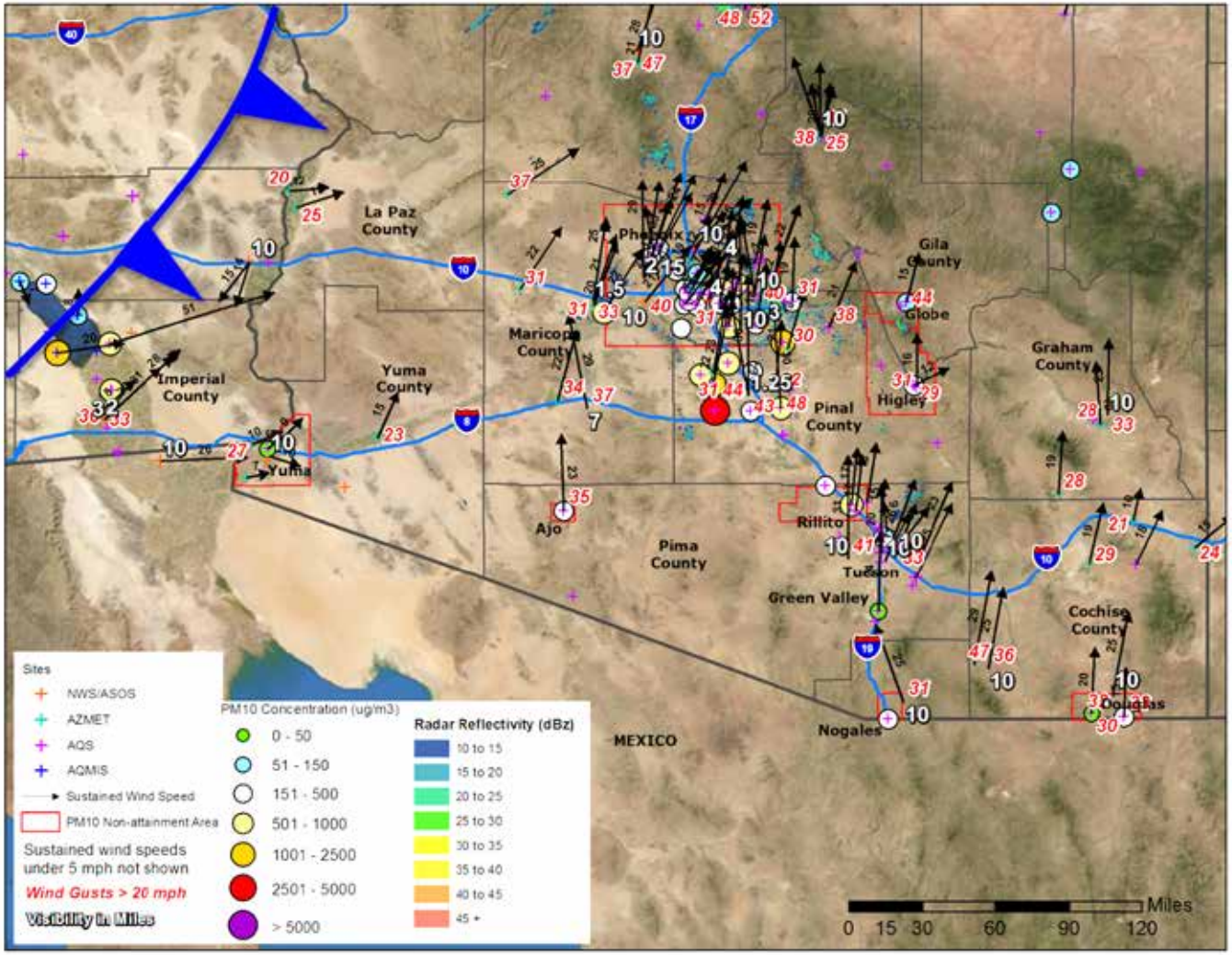

Figure 3-9. Meteorological and air quality data between 10:00 MST and 11:00 MST on April 8, 2013. Several monitors in Arizona reported hourly PM_{10} concentrations greater than 500 μg/m^3. The cold front was moving through far southeastern California.

Strong winds, high PM_{10} concentrations, and reduced visibilities continued into the afternoon hours on April 8 (Figures 3-10 through 3-14). Several monitors reported wind gusts of over 50 mph between 12:00 and 18:00 MST, and high PM_{10} concentrations were reported in all of the PM_{10} nonattainment areas in southern Arizona. As the cold front moved through Arizona, winds shifted from southwesterly ahead of the front to westerly or northwesterly behind it. At 12:00 MST (Figure 3-10), the front was moving through the Yuma area; at 14:00 MST (Figure 3-12), the front was moving into western Maricopa County, and at 16:00 MST (Figure 3-14), the front was moving through the Phoenix metropolitan area. Figures 3-11 and 3-13 provide a closer view of the Phoenix metropolitan area during the period of peak PM_{10} concentrations and wind speeds. In some areas, such as in Imperial and Yuma counties, PM_{10} concentrations increased following passage of the cold front (Figures 3-12 and 3-14). Yuma is particularly susceptible to high PM_{10} concentrations during periods of strong west-northwesterly winds due to transport from the Algodones Dunes. These dunes are located directly west-northwest of Yuma and consist of sandy surface soils that are easily lofted by strong winds. In addition, the MODIS satellite image shown in Figure 3-5 indicated a large dust plume near Yuma (this large plume would later affect southeastern Arizona early on April 9). Radar reflectivity data also showed returns in and downwind of the Yuma area, but since no rain was actually recorded there, it is likely that the radar was detecting the dust plume. Further east, as the front moved through the Phoenix metro area, PM_{10} concentrations decreased at most monitors, likely due to terrain blocking by mountains northwest of Phoenix, and the development of light rain showers in parts of Maricopa County. Precipitation strips suspended dust from the atmosphere.

At 18:00 MST (Figure 3-15), the cold front stretched from the southeast side of Phoenix southwestward across Pima County. Gusty west-northwesterly winds behind the front continued to loft and transport dust at some monitors, causing continued low visibilities and elevated PM_{10} concentrations, but PM_{10} concentrations were not nearly as high as those reported earlier in the day. At 20:00 MST (Figure 3-16), the cold front was located from near Higley southwestward through Pima County. Radar showed light rain showers in the Phoenix metropolitan area at this time, which likely helped to lower PM_{10} concentrations. Monitors immediately behind the front, where rain had not yet developed, such as Ajo, Higley, and several monitors in Pinal County, reported PM_{10} concentrations in excess of 1,000 $\mu g/m^3$. By 22:00 MST (Figure 3-17), the cold front was moving through the Tucson area. Monitors from Phoenix westward to Imperial County reported lighter winds as a result of the front moving out of those areas, and scattered light rain showers also likely helped to decrease PM_{10} concentrations. Gusty winds and elevated PM_{10} concentrations continued near the front in southeastern Arizona.

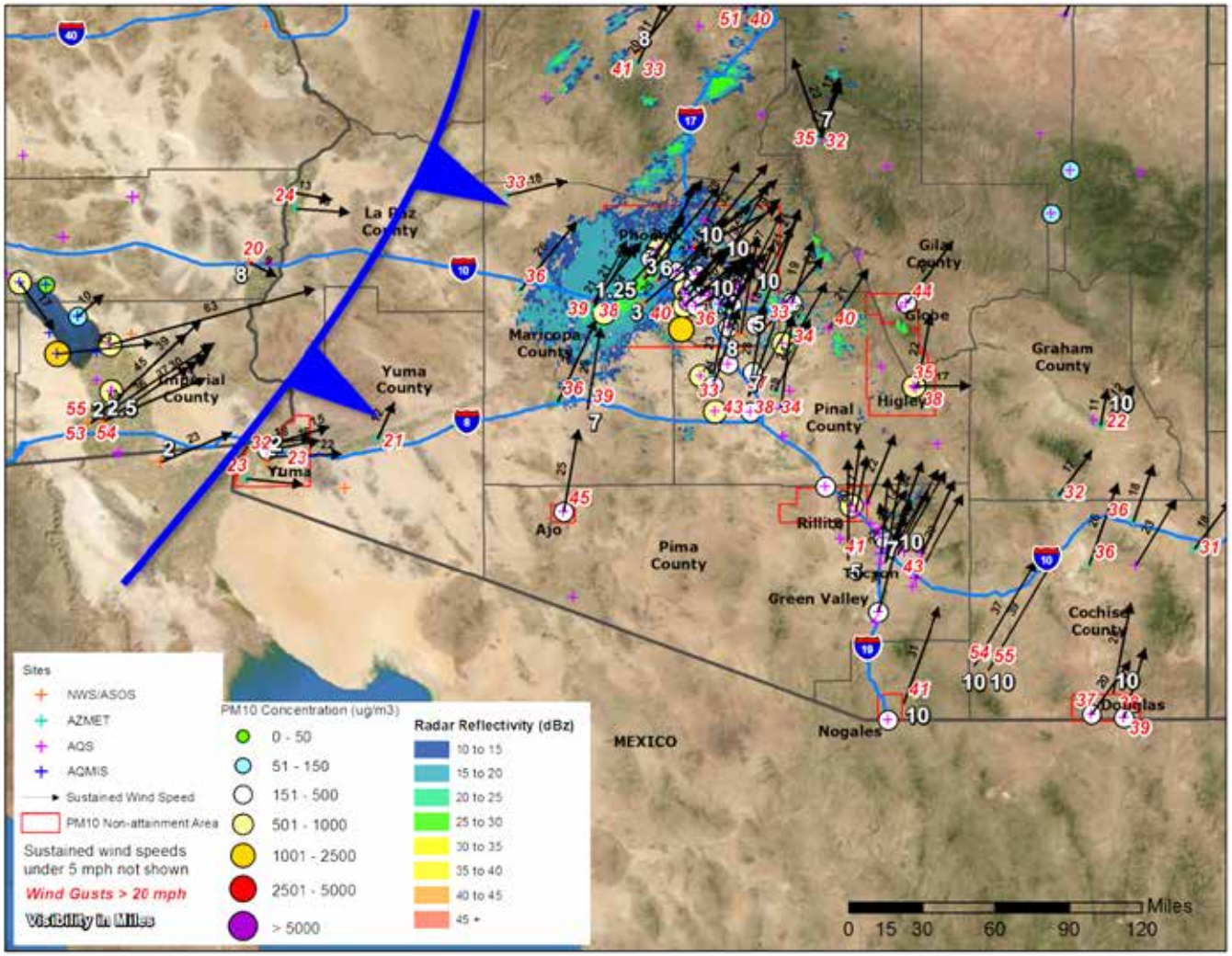

Figure 3-10. Meteorological and air quality data between 12:00 MST and 13:00 MST on April 8, 2013. Strong winds, high PM_{10} concentrations, and locally reduced visibilities were reported throughout southeastern California and Arizona.

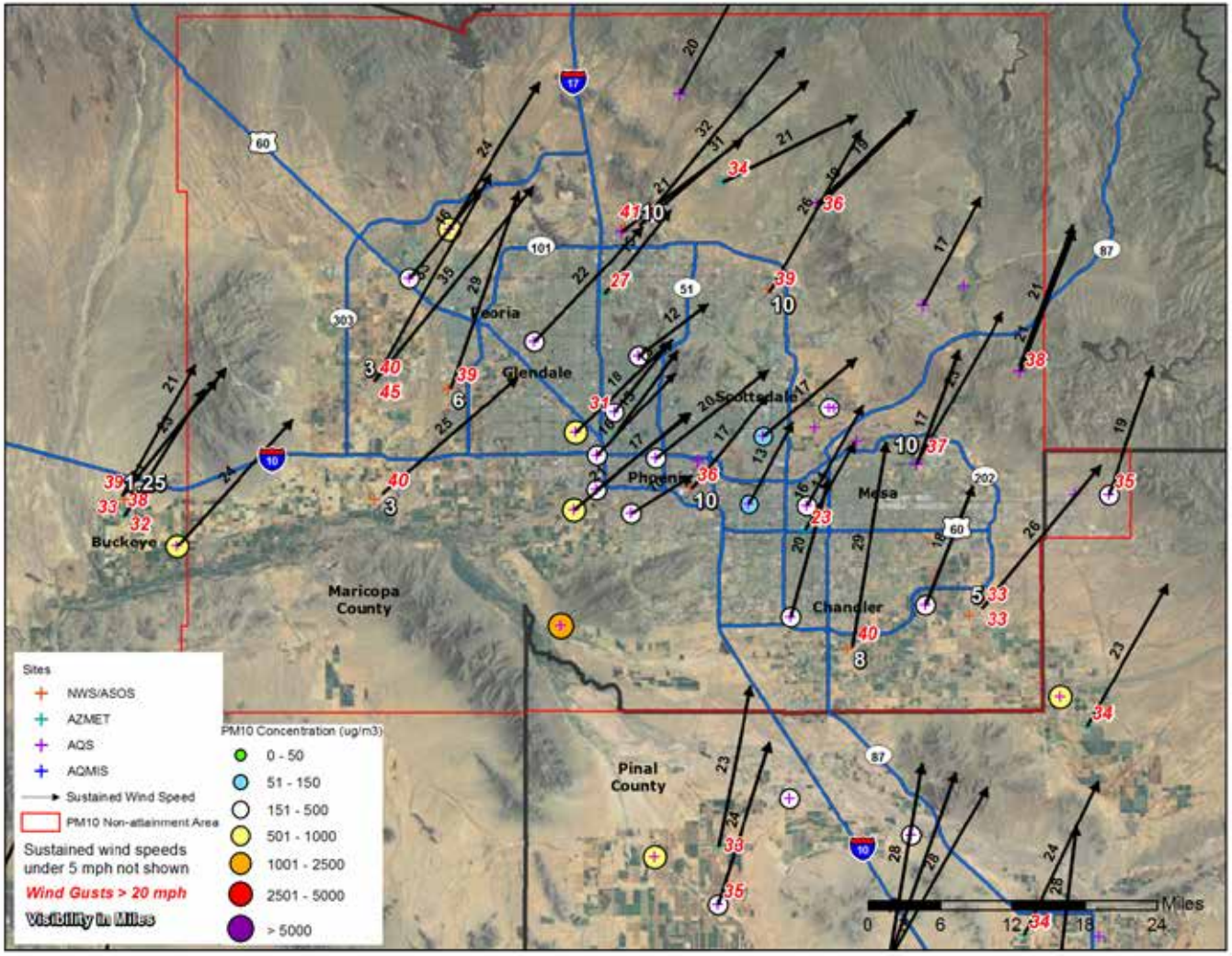

Figure 3-11. Meteorological and air quality data in the Phoenix metropolitan area between 12:00 MST and 13:00 MST on April 8, 2013. Strong winds, high PM_{10} concentrations, and locally reduced visibilities were reported throughout the region.

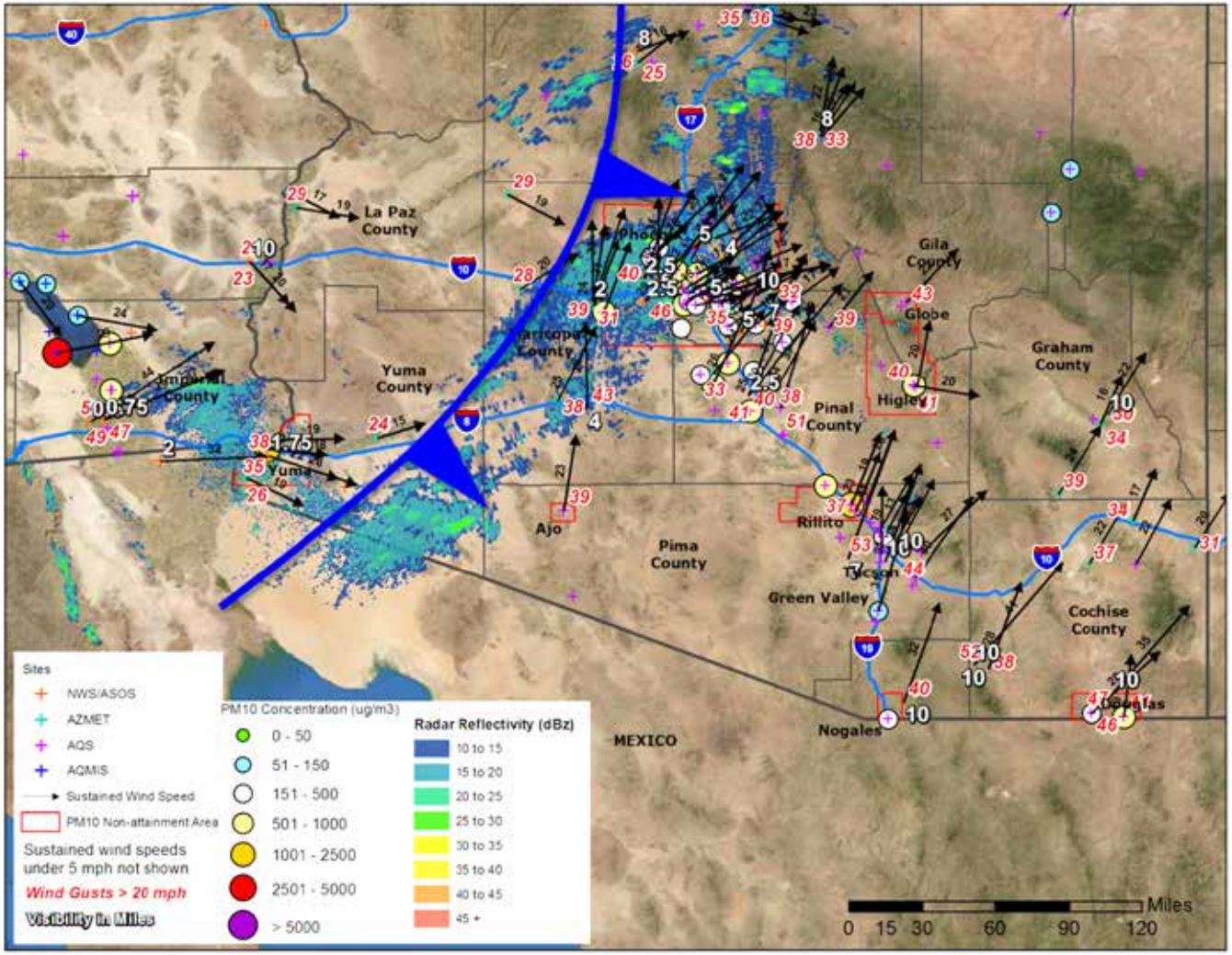

Figure 3-12. Meteorological and air quality data between 14:00 MST and 15:00 MST on April 8, 2013. Strong winds behind the cold front lofted and transported dust into Yuma, where 1-hr PM_{10} concentrations exceeded 1,000 µg/m^3. Strong winds, high PM_{10} concentrations, and low visibilities continued ahead of the front across central and eastern Arizona.

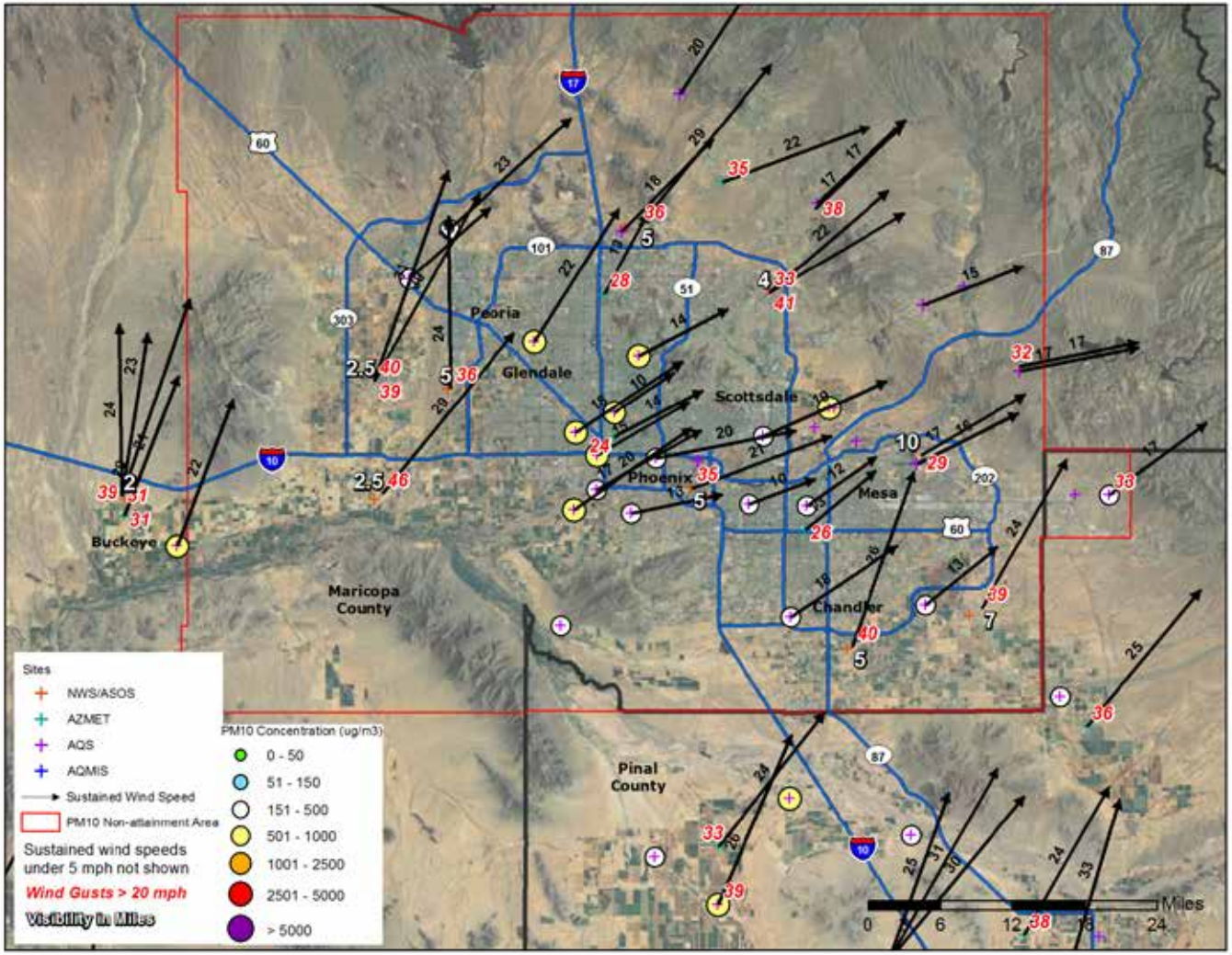

Figure 3-13. Meteorological and air quality data in the Phoenix metropolitan area between 14:00 MST and 15:00 MST on April 8, 2013. Strong winds, high PM_{10} concentrations, and low visibilities continued across Maricopa and Pinal counties.

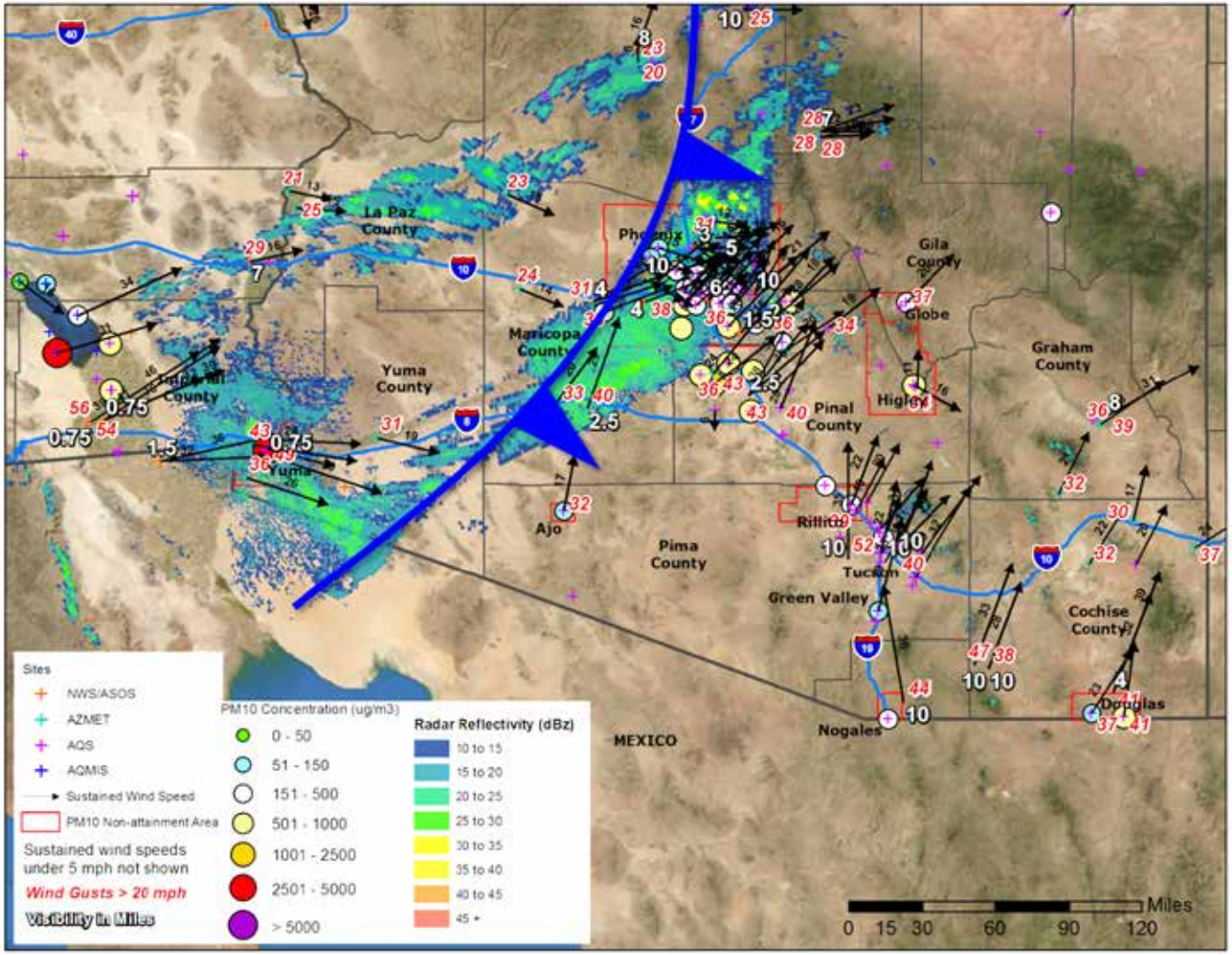

Figure 3-14. Meteorological and air quality data between 16:00 MST and 17:00 MST on April 8, 2013. Very high PM_{10} concentrations (in excess of 2,500 µg/m^3) were reported in Yuma. The cold front was moving into the northwest corner of the Phoenix metropolitan area.

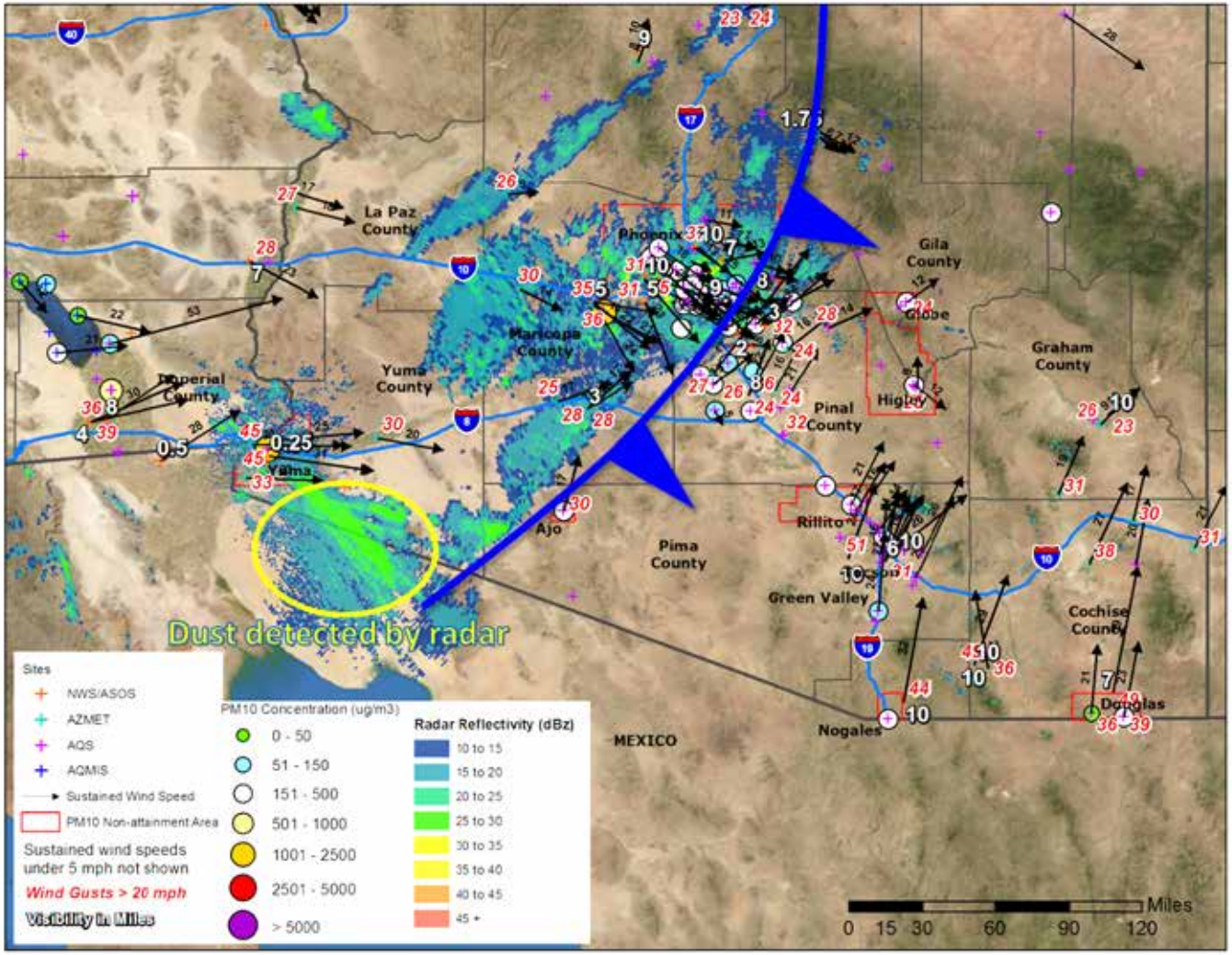

Figure 3-15. Meteorological and air quality data between 18:00 MST and 19:00 MST on April 8, 2013. Strong winds behind the cold front continued to loft dust and result in high PM_{10} concentrations in Yuma. Doppler radar also indicated a region of reflectivity southeast of Yuma, which was likely a large dust plume. Winds shifted to northwesterly in the Phoenix area as the cold front moved through.

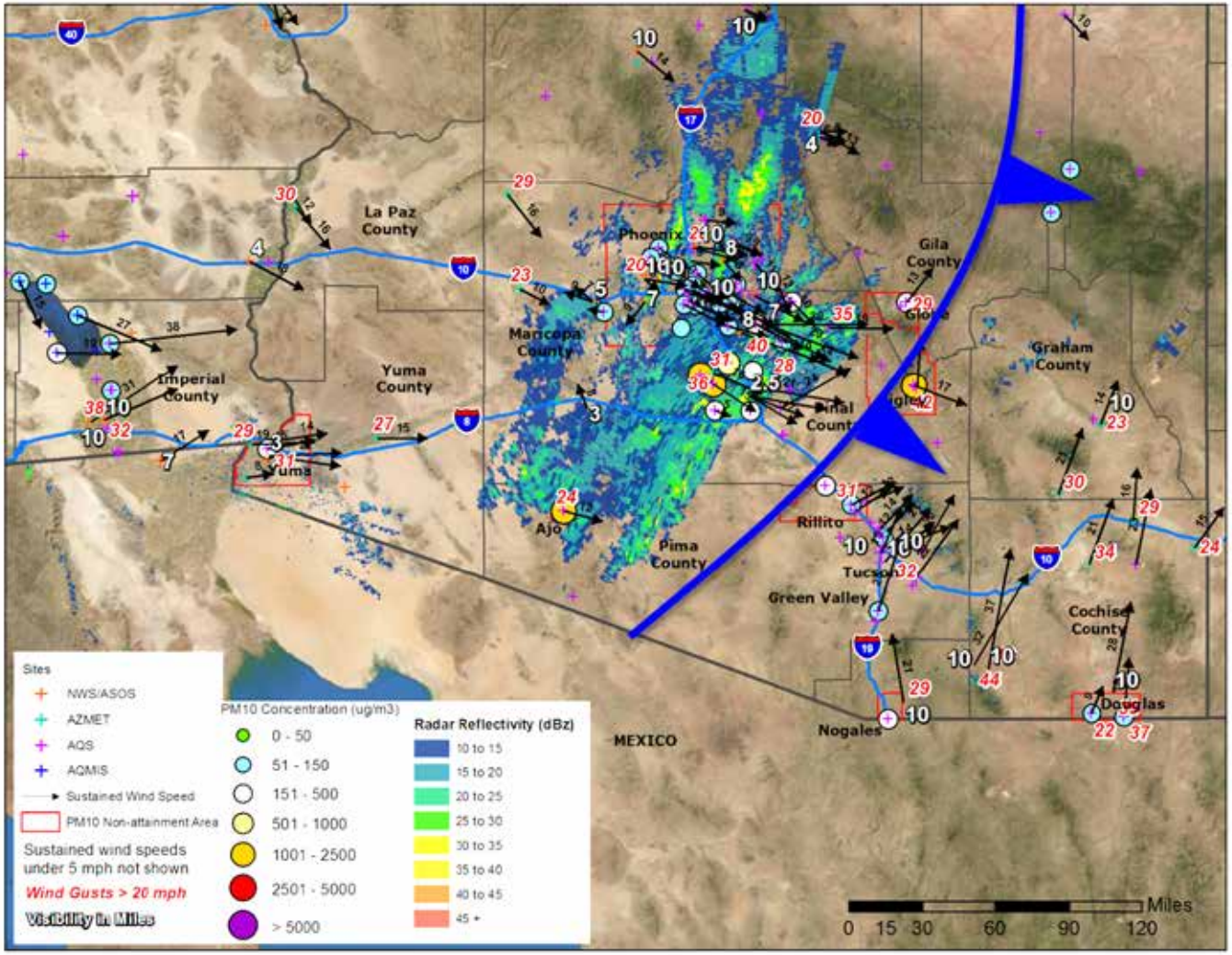

Figure 3-16. Meteorological and air quality data between 20:00 MST and 21:00 MST on April 8, 2013. Scattered rain showers developed in central Arizona behind the front, resulting in lower PM_{10} concentrations in some locations. The eastward-moving dust plume that previously affected Yuma was now causing high PM_{10} concentrations at Ajo.

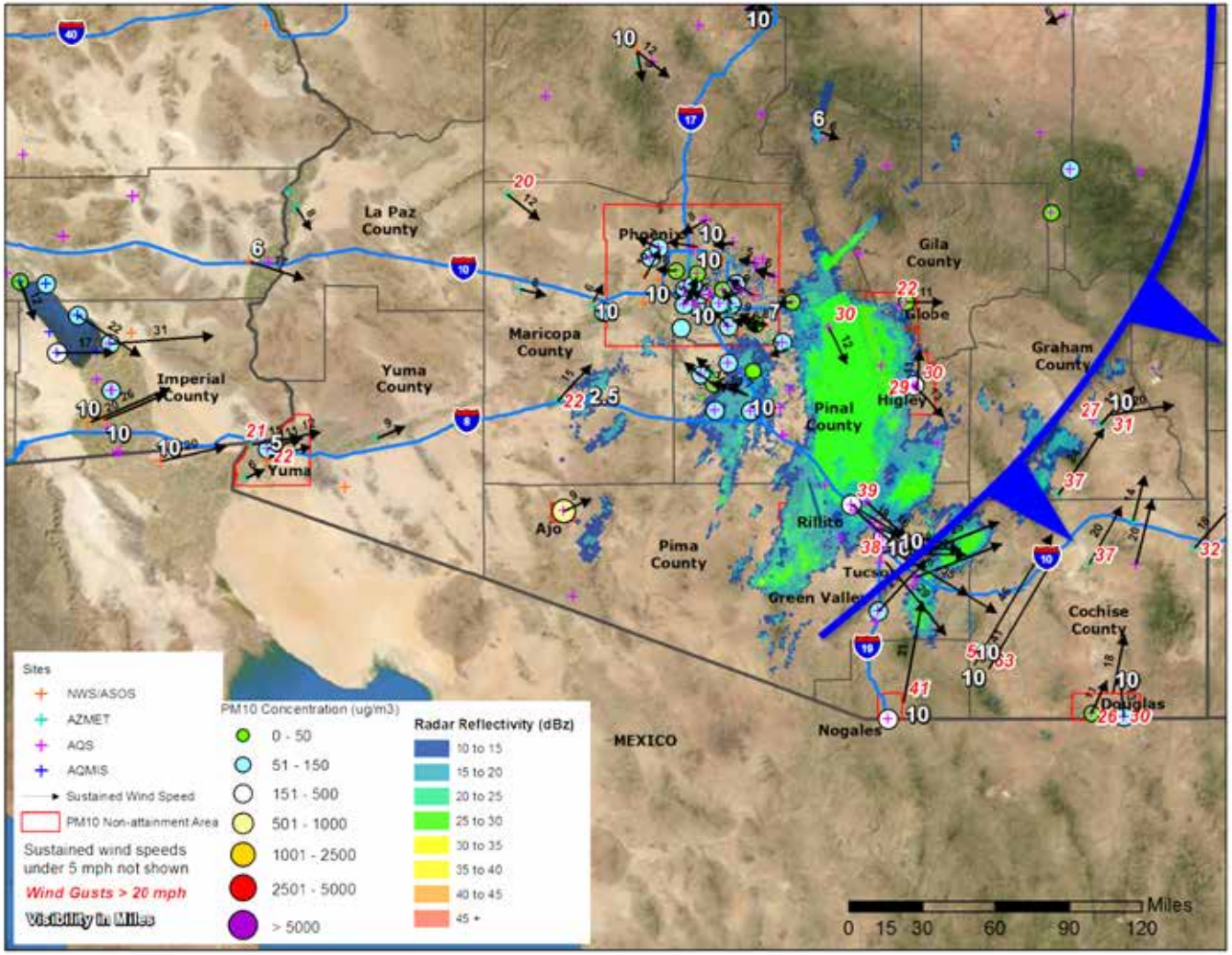

Figure 3-17. Meteorological and air quality data between 22:00 MST and 23:00 MST on April 8, 2013. Winds gradually diminished across central and western Arizona as the cold front departed to the east. High PM_{10} concentrations continued at Ajo, likely attributable to the large dust plume generated earlier in the day over southeastern California and far northwestern Mexico.

3.4 Suspended Dust on April 9, 2013

As the front moved eastward out of the region, wind speeds diminished and PM_{10} concentrations decreased across most of Arizona. However, a large area of dust originating from southeastern California, southwestern Arizona, and far northwestern Mexico that had been lofted by the high winds on April 8 moved into southeastern Arizona early on April 9, which resulted in high PM_{10} concentrations at several monitors in southeastern Arizona, including Rillito, Green Valley, Geronimo, South Tucson, and Nogales. **Figure 3-18** shows a time series of PM_{10} concentrations and wind speeds at the Nogales monitor, and illustrates the sharp increase in PM_{10} concentrations coincident with low wind speeds early on April 9. Sharply reduced visibilities were also reported during the period of high PM_{10} concentrations (**Figure 3-19**). **Figures 3-20 through 3-25** are similar to Figures 3-6 through 3-17, but show data between 00:00 MST and 11:00 MST on April 9.

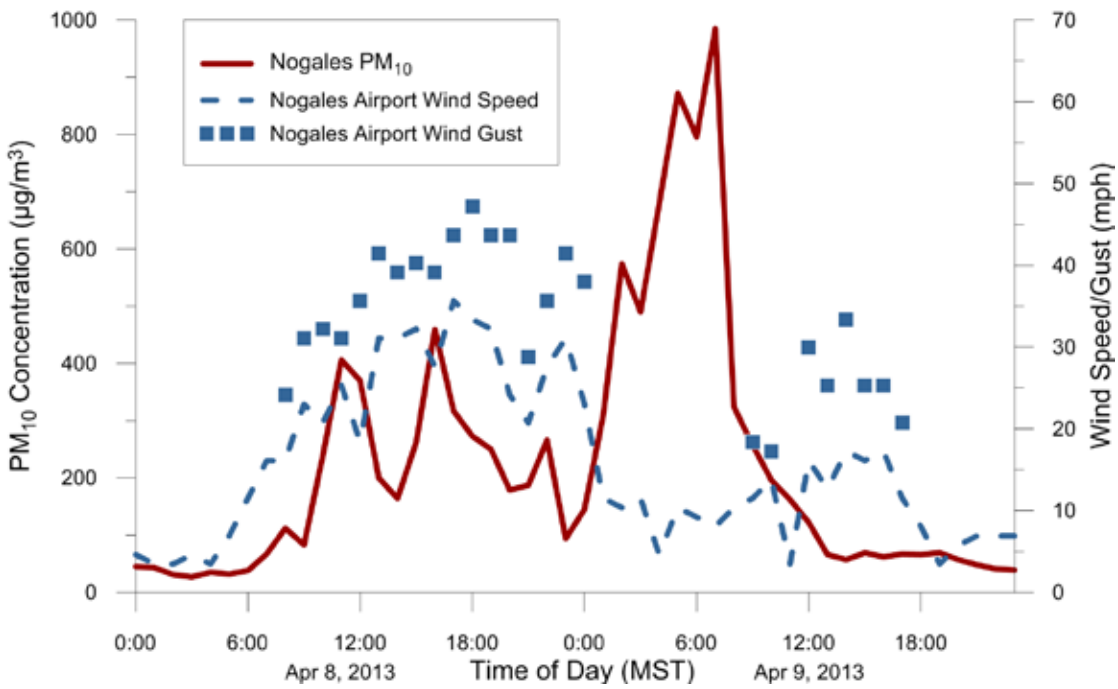

Figure 3-18. Hourly PM_{10} concentrations at the Nogales monitor and wind speeds at Nogales Airport on April 8 and 9, 2013. High PM_{10} concentrations were reported after midnight on April 9 while wind speeds were low. The PM_{10} is attributable to dust transported into the region from the west.

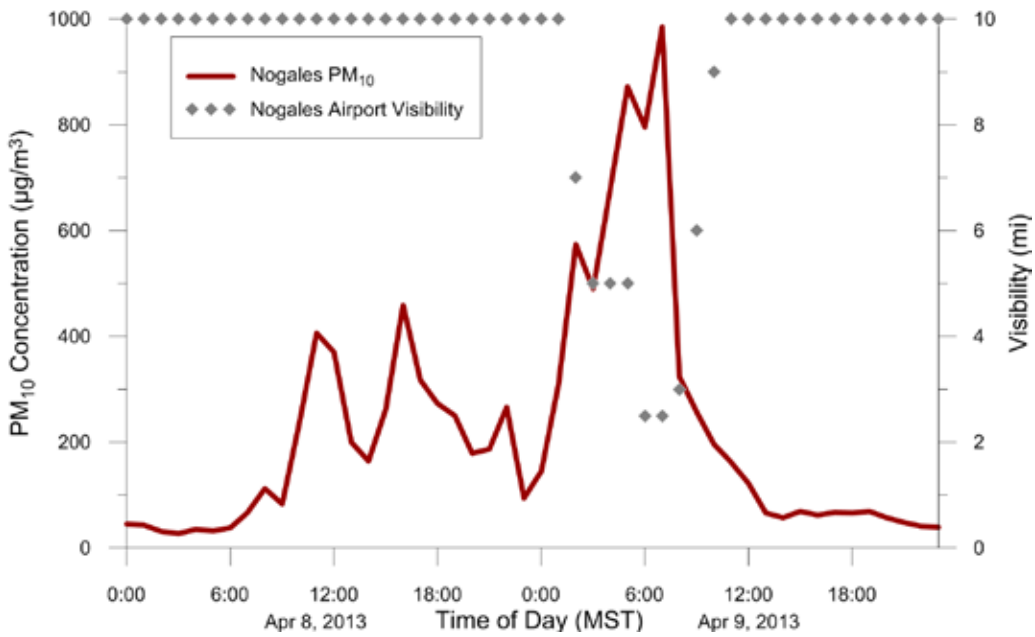

Figure 3-19. Hourly PM_{10} concentrations at the Nogales monitor and visibilities at Nogales Airport on April 8 and 9, 2013. High PM_{10} concentrations were reported after midnight on April 9 coincident with low visibilities. The PM_{10} is attributable to dust transported into the region from the west.

At 00:00 MST on April 9 (Figure 3-20), gusty winds, reduced visibilities, and elevated PM_{10} concentrations persisted in far southeastern Arizona near the cold front. At 02:00 MST (Figure 3-21), PM_{10} concentrations sharply increased at Nogales and Green Valley, but wind speeds were light to moderate southerly. The increase in PM_{10} concentrations is attributable to the large amounts of dust lofted in southeastern California, southwestern Arizona, and far northwestern Mexico by the strong winds on April 8. This dust moved eastward behind the cold front and toward southeastern Arizona, and as winds diminished, the dust was left suspended in these areas through the overnight hours. PM_{10} concentrations continued to increase through the 04:00 MST (Figure 3-22) and 06:00 MST (Figure 3-23) hours in these areas, along with low visibilities and continued light winds. Figure 3-22 includes Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) 12-hour backward trajectories ending at 04:00 MST on April 9 at the Rillito, Green Valley, and Nogales monitors. The trajectories indicate boundary layer transport from southeastern California and northwestern Mexico, very near the large dust plume seen on the MODIS satellite image in Figure 3-5. The PM_{10} concentrations during this period were high enough to result in PM_{10} exceedances at the Rillito, Green Valley, Geronimo, South Tucson, and Nogales monitors. Please note the South Tucson monitor only measures 24-hr PM_{10} concentrations; thus, data from that monitor are not shown in the following figures.

After sunrise (Figures 3-24 and 3-25), increased atmospheric mixing and higher wind speeds dispersed the suspended dust in southeastern Arizona; subsequently, PM_{10} concentrations decreased and visibilities improved. Gusty winds were reported regionwide through the afternoon hours on April 9, but the winds were not as strong as those measured on April 8, and scattered light rain showers associated with the cold front likely helped to dampen surface soils enough to limit additional lofting of dust.

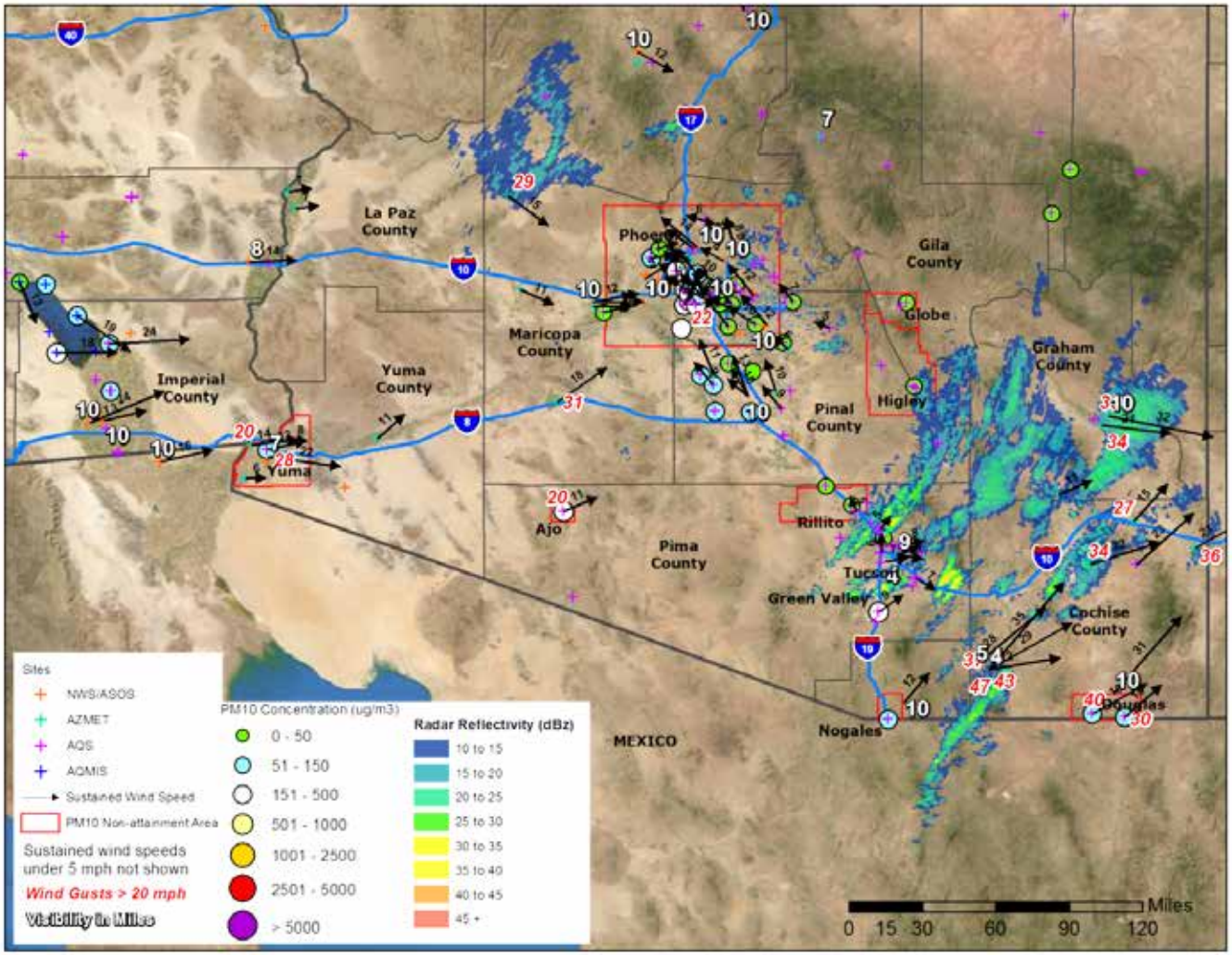

Figure 3-20. Meteorological and air quality data between 00:00 MST and 01:00 MST on April 9, 2013. As the cold front moved out of Arizona, wind speeds and PM_{10} concentrations decreased at most monitors.

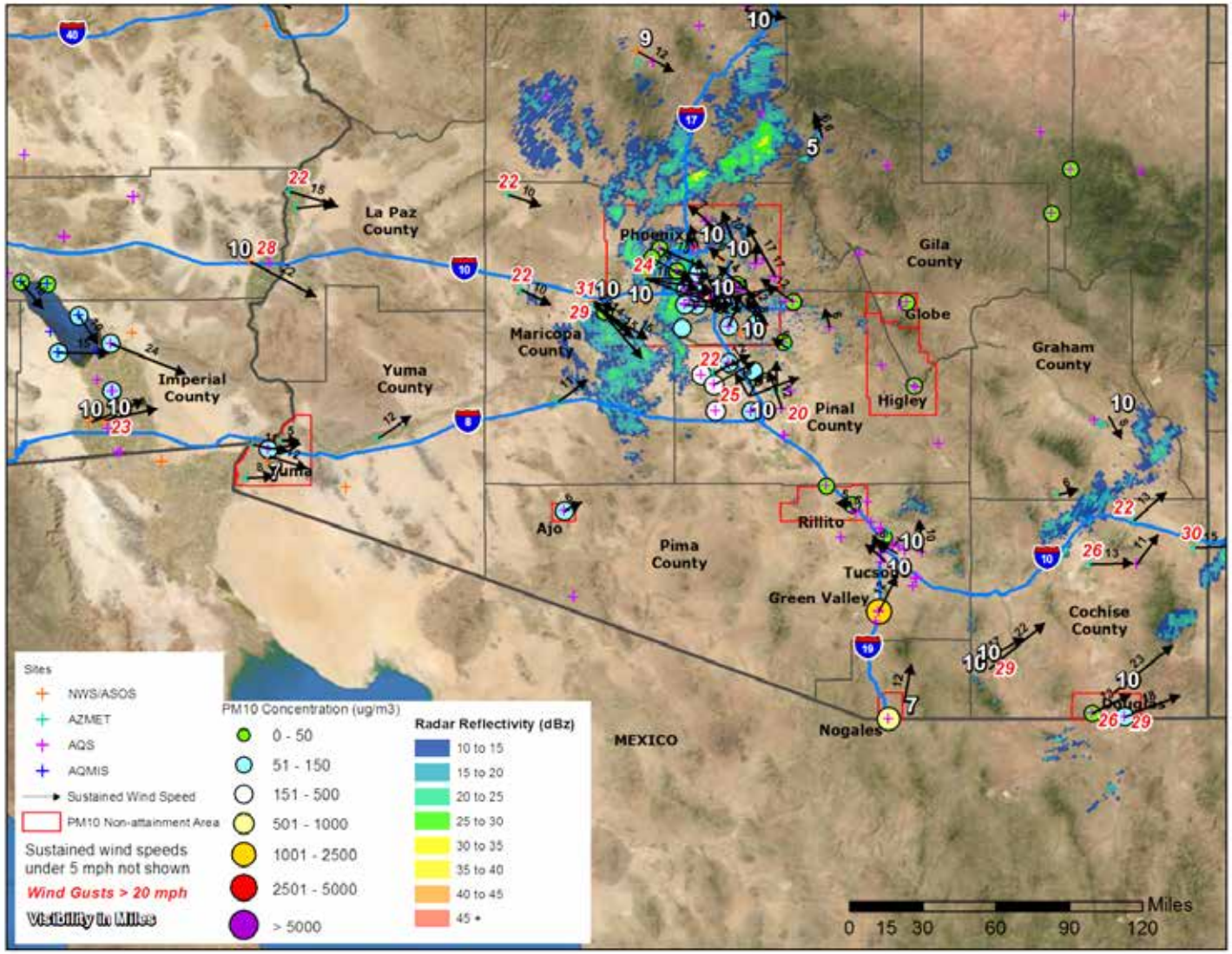

Figure 3-21. Meteorological and air quality data between 02:00 MST and 03:00 MST on April 9, 2013. The large dust plume generated by strong winds on April 8 in southeastern California, southwestern Arizona, and far northwestern Mexico moved eastward into southeastern Arizona, causing high PM_{10} concentrations at Nogales and Green Valley.

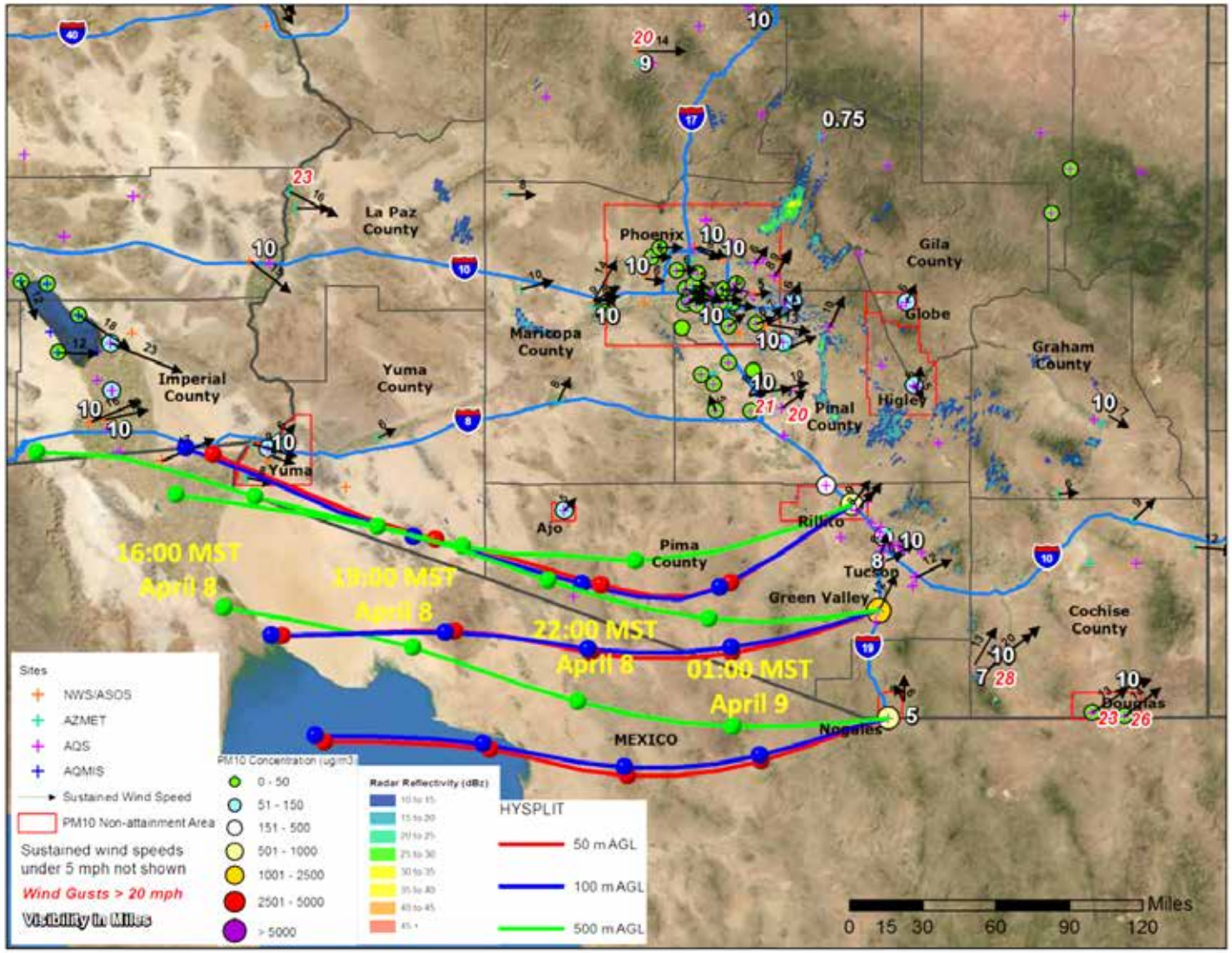

Figure 3-22. Meteorological and air quality data between 04:00 MST and 05:00 MST on April 9, 2013. The dust plume generated on April 8 continued to cause high PM_{10} concentrations at the Nogales, Green Valley, Geronimo, and Rillito monitors. HYSPLIT 12-hr backward trajectories ending at these monitors show transport from the area of the large dust plume.

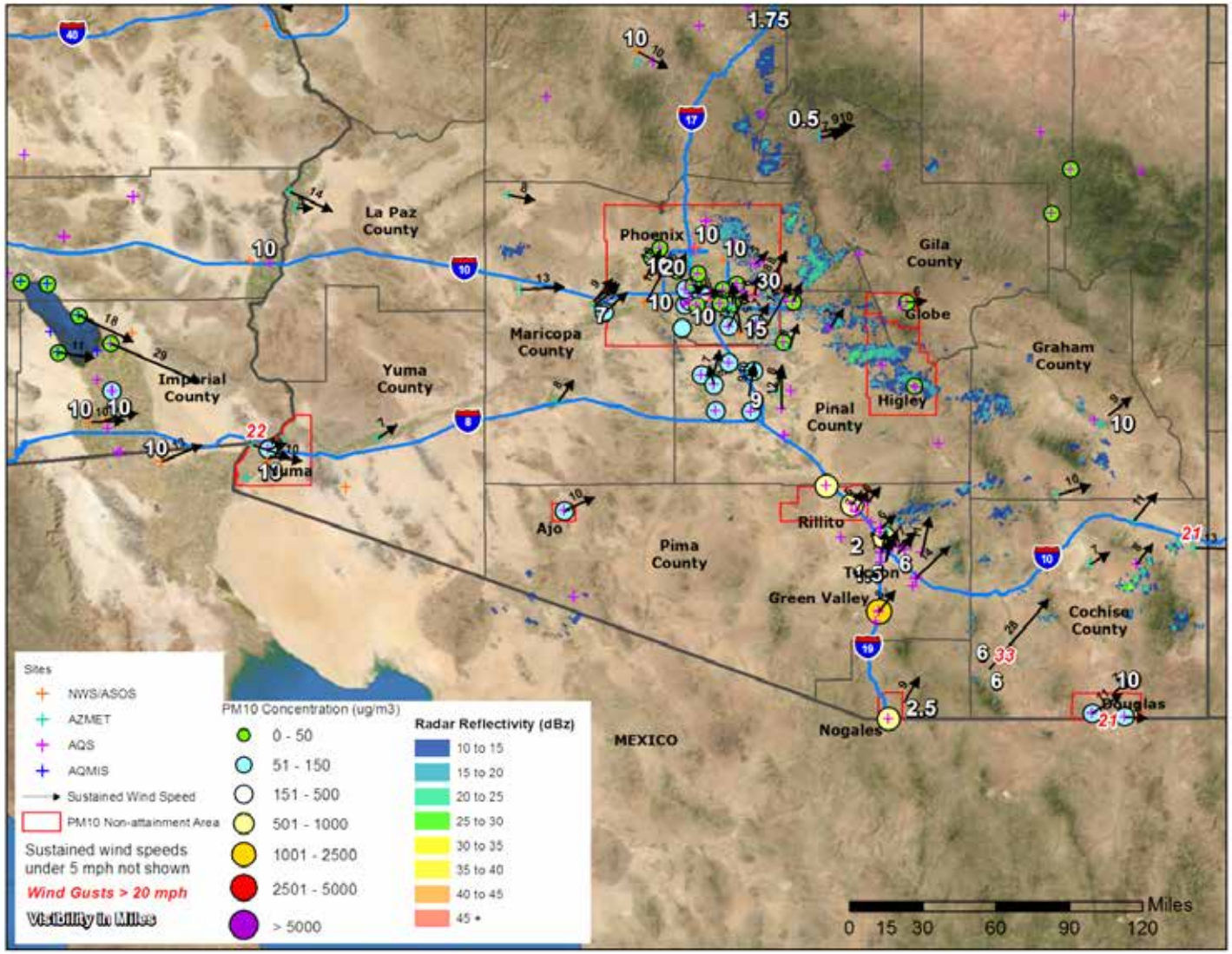

Figure 3-23. Meteorological and air quality data between 06:00 MST and 07:00 MST on April 9, 2013. High PM_{10} concentrations and low visibilities were reported around Tucson and Nogales. When the large dust plume moved into southeastern Arizona, lighter wind speeds limited dispersion and mixing of this dust plume, leaving the dust suspended in the lower atmosphere.

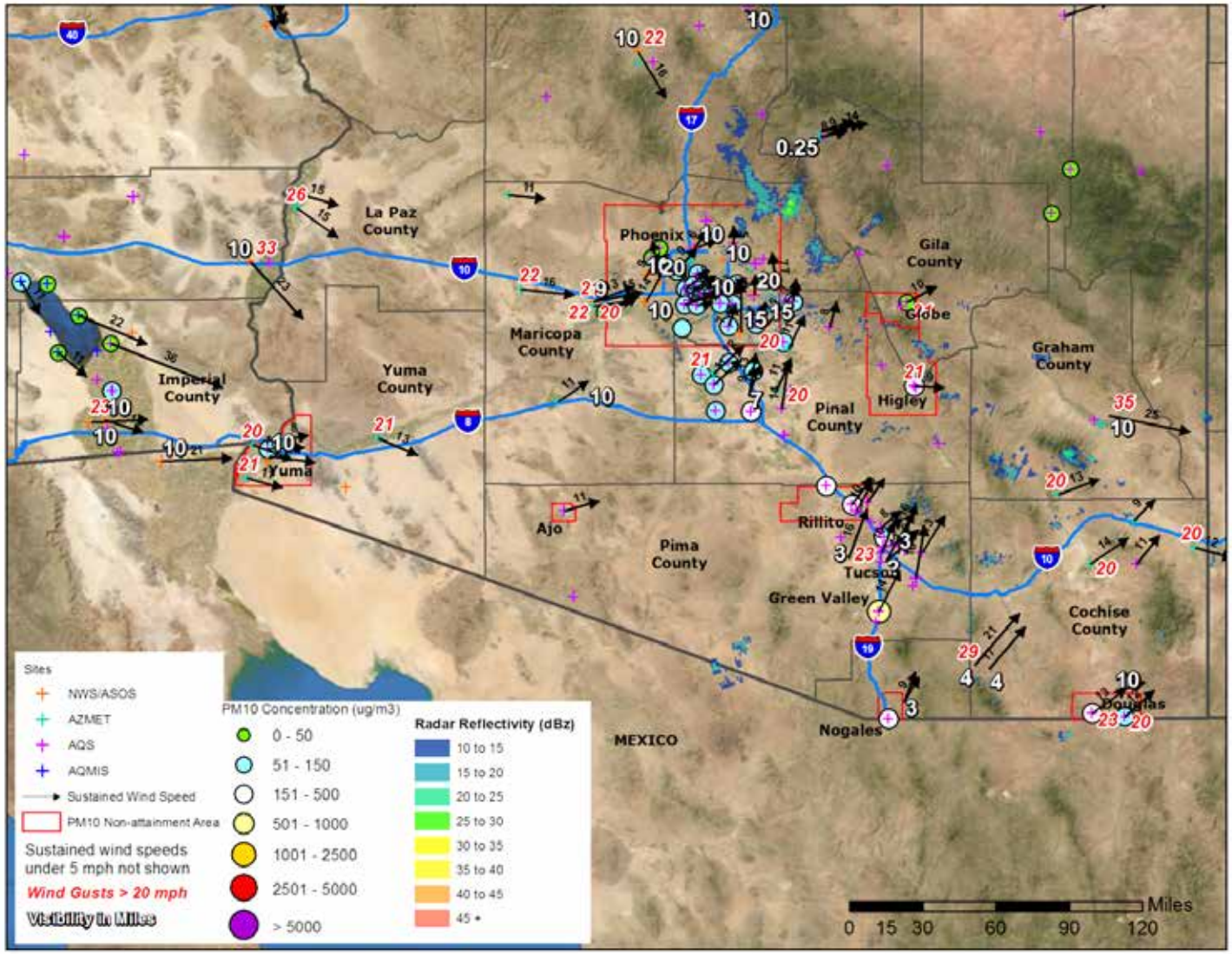

Figure 3-24. Meteorological and air quality data between 08:00 MST and 09:00 MST on April 9, 2013. Increasing wind speeds and atmospheric mixing started to disperse the dust plume over southeastern Arizona, but residual dust continued to cause elevated PM_{10} concentrations and low visibilities.

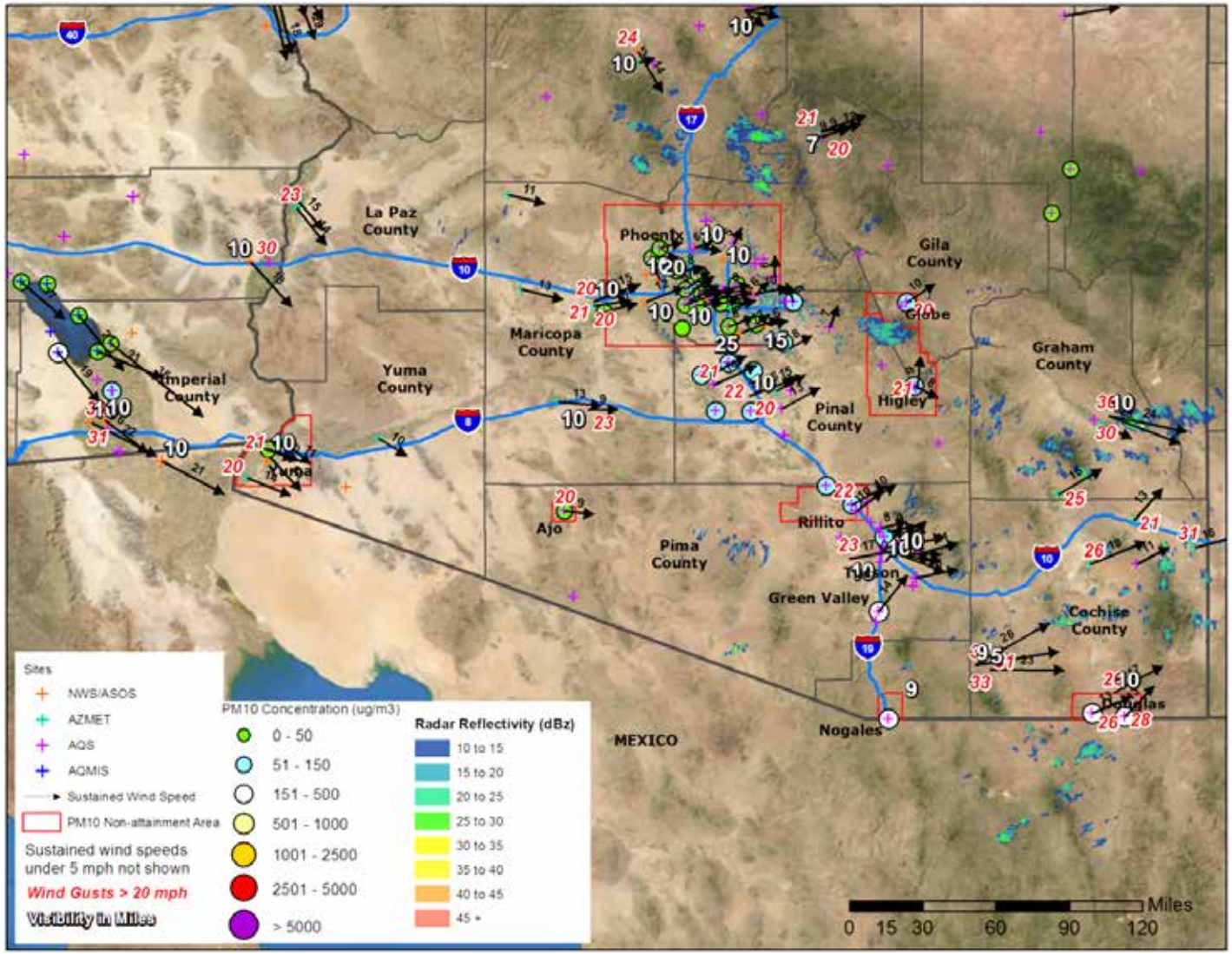

Figure 3-25. Meteorological and air quality data between 10:00 MST and 11:00 MST on April 9, 2013. PM_{10} concentrations continued to decrease and visibilities improved in southeastern Arizona as the dust plume dispersed.

3.5 Summary

The information presented in this section demonstrates a clear causal relationship between the windblown dust and the PM_{10} exceedances measured at numerous monitors across Arizona on April 8 and 9, 2013. The PM_{10} and wind data shown in this section illustrate the spatial and temporal representation of the windblown dust and the cold front responsible for the strong winds. Strong southwesterly winds ahead of the front lofted large amounts of dust and PM_{10} into the lower atmosphere. This dust likely originated in the vast, open areas of the Sonoran Desert of southeastern California, southern Arizona, and far northwestern Mexico. Strong winds and high PM_{10} concentrations were observed throughout southern Arizona and southeastern California, illustrating the widespread nature of this uncontrollable event. The time-series plots of air quality and meteorological data found in this section and in Appendix A show that the sharp increase in PM_{10} concentrations coincided with the onset of the strong winds on April 8. Following passage of the cold front, a large area of dust originating in southeastern California, southwestern Arizona, and far northwestern Mexico moved eastward into southeastern Arizona, resulting in continued high PM_{10} concentrations and additional exceedances on April 9.

4. Historical Norm

4.1 Analysis

PM_{10} concentrations in Arizona on April 8 and 9, 2013, were unusual and in excess of normal historical fluctuations. To establish the severity of this event, PM_{10} concentrations measured on April 8 and 9, 2013, were compared to a historical 2008–2013 five-year annual data set for each monitor that recorded an exceedance (Appendix C). At many sites, the PM_{10} concentrations measured on April 8 and 9, 2013, were among the highest hourly and 24-hr averages measured over the last five years, with hourly concentrations at some sites exceeding 1,000 µg/m^3. For example, the PM_{10} concentrations measured at the Green Valley monitor (**Figure 4-1**) on April 9, 2013, resulted in the highest 24-hr average measured over the five-year period.

Historical daily cumulative distributions of 24-hr average PM_{10} concentrations were created for monitors that exceeded the NAAQS during the April 8−9, 2013 event, to provide additional evidence in establishing the severity of the event (Appendix C). **Figure 4-2** shows a histogram of the 24-hr average PM_{10} concentrations at the Green Valley monitor. The concentration on April 9, 2013, was more than ten times higher than the 95th percentile. Concentrations in excess of the 95th percentile are considered to be unusual.[3]

Figures 4-3 through 4-16 show similar plots to the figures described above for monitors in each of the nonattainment areas discussed in this report. Similar figures for all exceedance monitors during the April 8-9, 2013, event are provided in Appendix C.

[3] Excluding days on which concentrations caused by exceptional events exceed the 95th percentile threshold employs a general test of statistical significance and has the effect of ensuring that such concentrations would clearly fall beyond the range of normal expectations for air quality during a particular time of year. Source: "The Treatment of Data Influenced by Exceptional Events," 71 FR 12598.

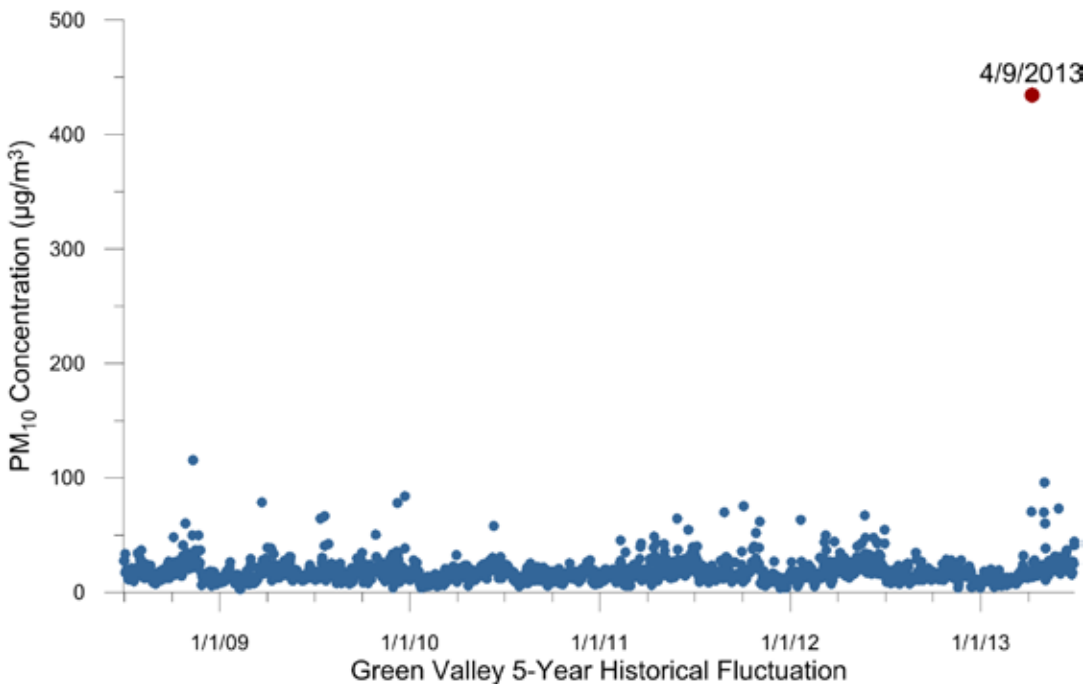

Figure 4-1. Scatter plot of 24-hour average PM_{10} concentrations at the Green Valley monitor for July 2008 through June 2013. The 24-hr average PM_{10} concentration on April 9, 2013, is in red.

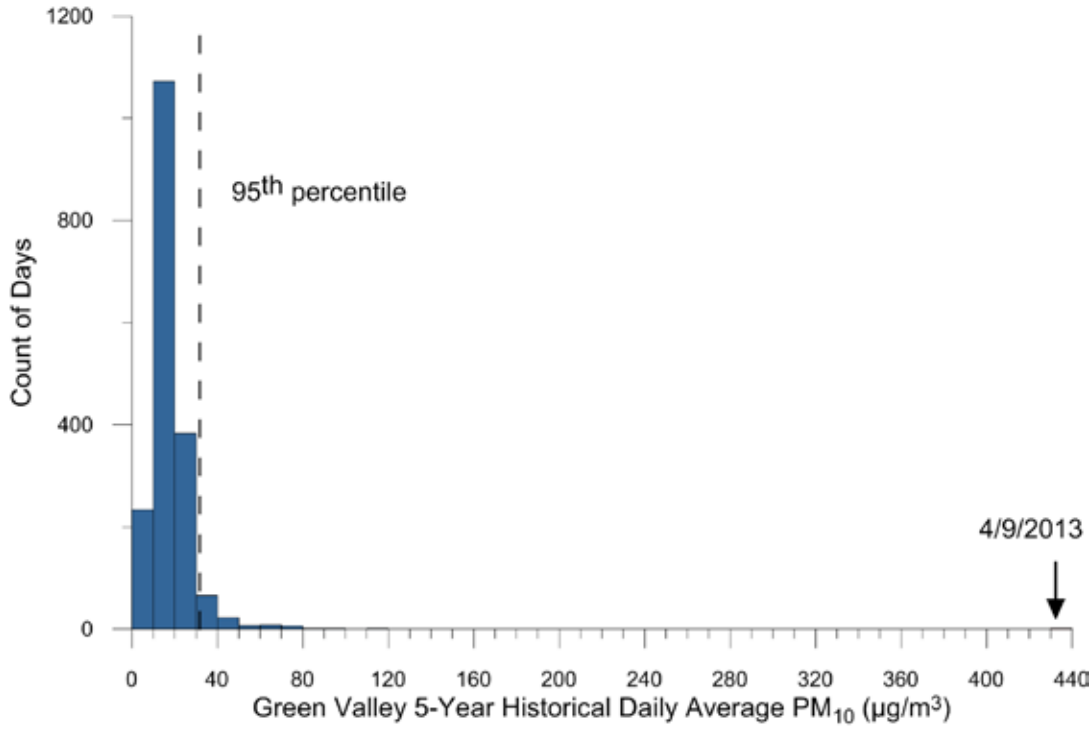

Figure 4-2. Histogram of 24-hr average PM_{10} concentrations at the Green Valley monitor for July 2008 through June 2013. The 24-hr average PM_{10} concentration on April 9, 2013, was far in excess of the 95th percentile.

4.1.1 Maricopa County (Phoenix)

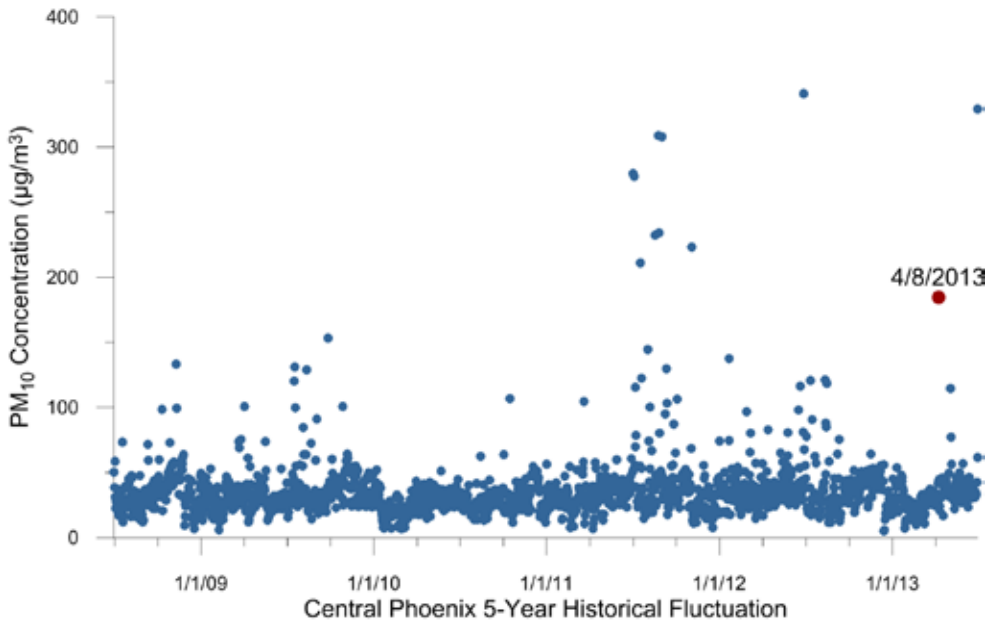

Figure 4-3. Scatter plot of 24-hr average PM_{10} concentrations at the Central Phoenix monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is in red.

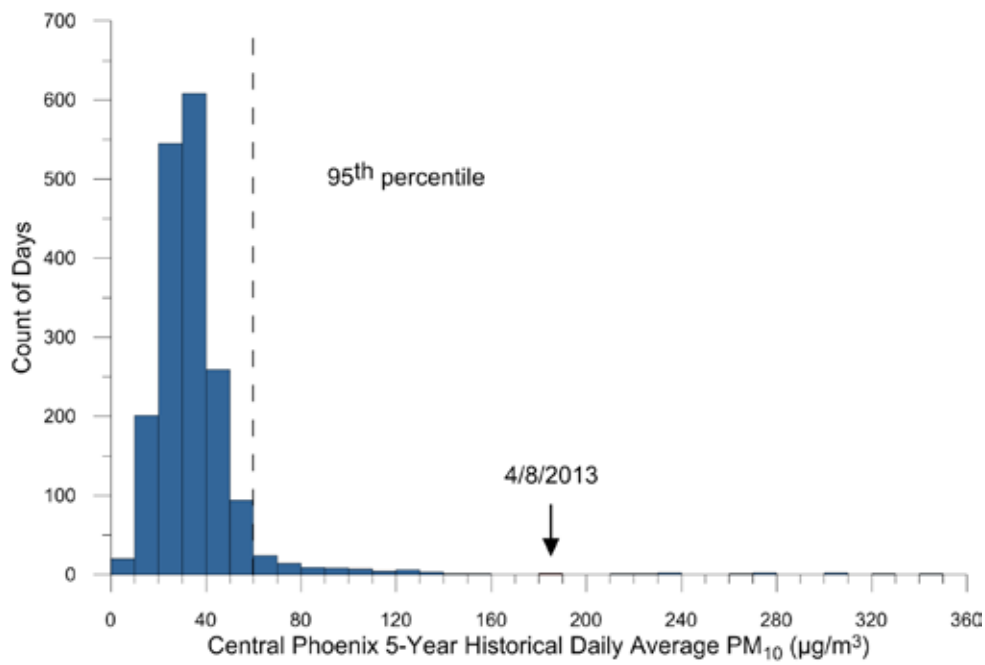

Figure 4-4. Histogram of 24-hr average PM_{10} concentrations at the Central Phoenix monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was approximately three times the 95th percentile.

4.1.2 Yuma

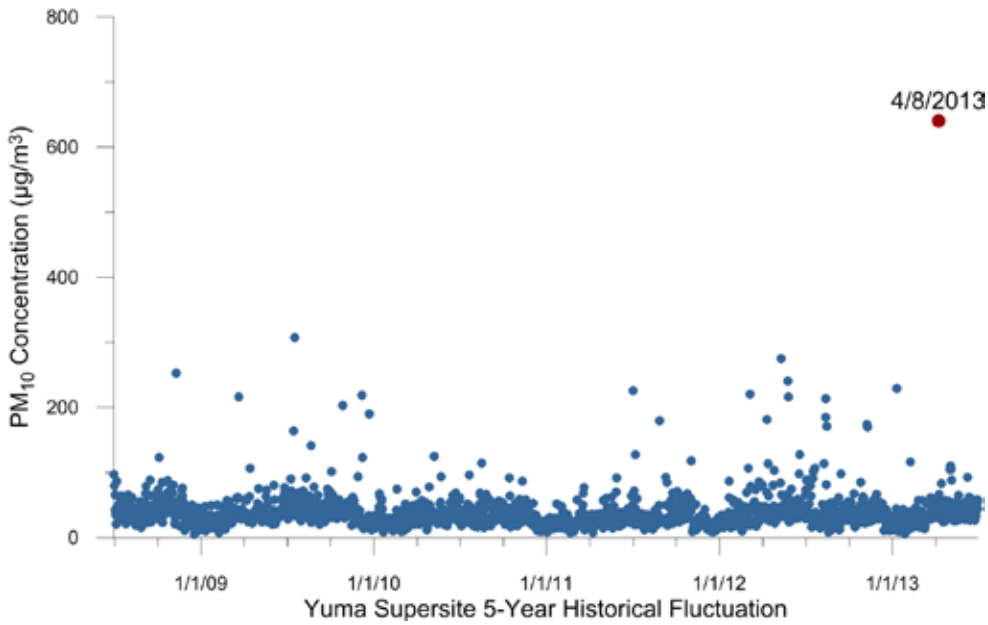

Figure 4-5. Scatter plot of 24-hr average PM_{10} concentrations at the Yuma Supersite monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is in red.

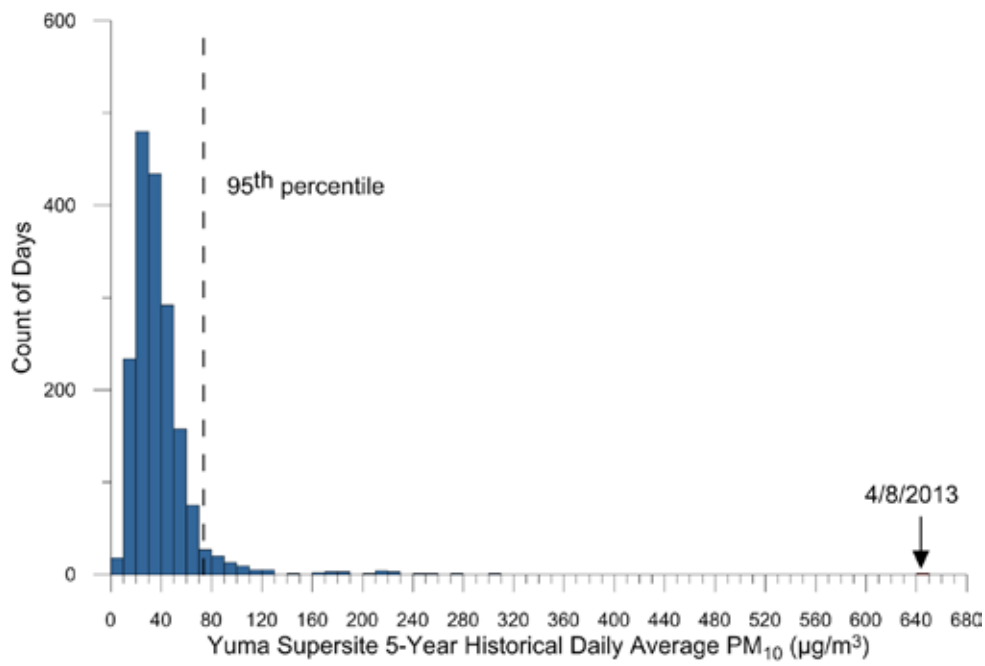

Figure 4-6. Histogram of 24-hr average PM_{10} concentrations at the Yuma Supersite monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over eight times higher than the 95th percentile.

4.1.3 Ajo

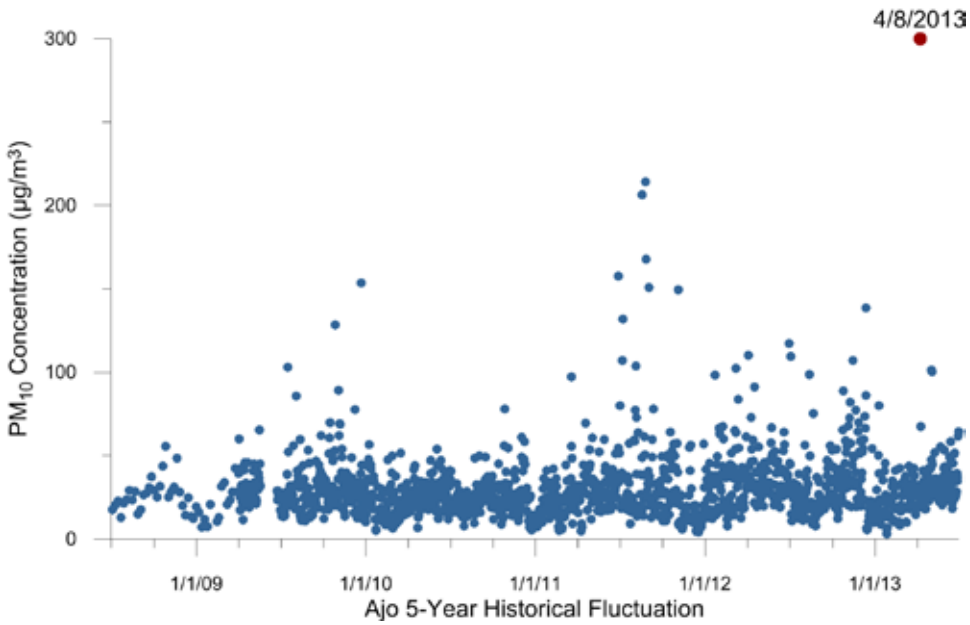

Figure 4-7. Scatter plot of 24-hr average PM_{10} concentrations at the Ajo monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is in red. Prior to April 1, 2009, the Ajo monitor operated on a one-in-six day schedule.

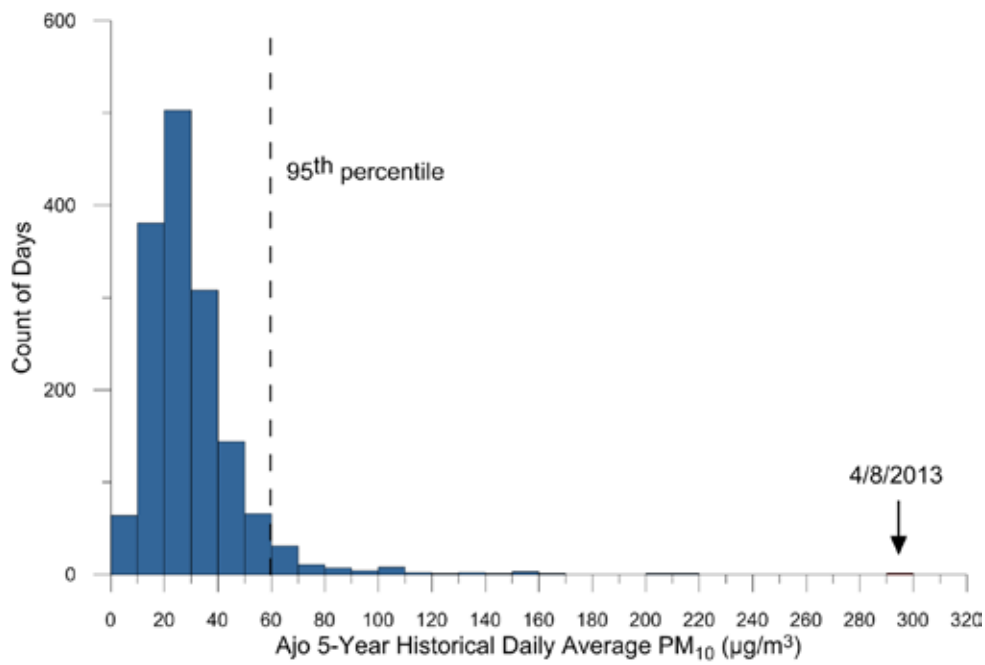

Figure 4-8. Histogram of 24-hr average PM_{10} concentrations at the Ajo monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over four times higher than the 95th percentile.

4.1.4 Rillito/Pima County

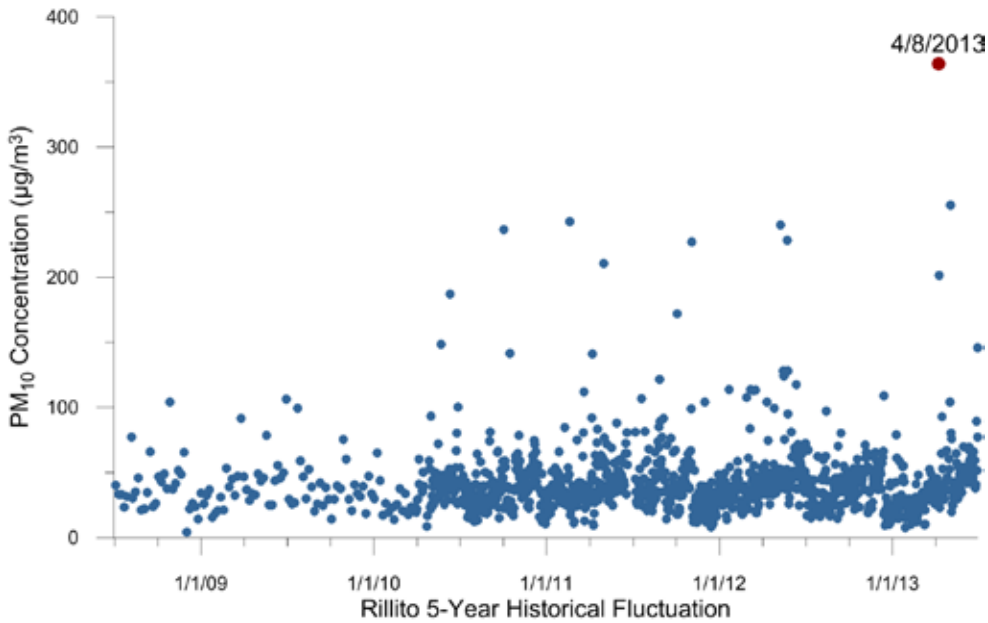

Figure 4-9. Scatter plot of 24-hr average PM_{10} concentrations at the Rillito monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is in red. Prior to April 1, 2010, the Rillito monitor operated on a one-in-six day schedule.

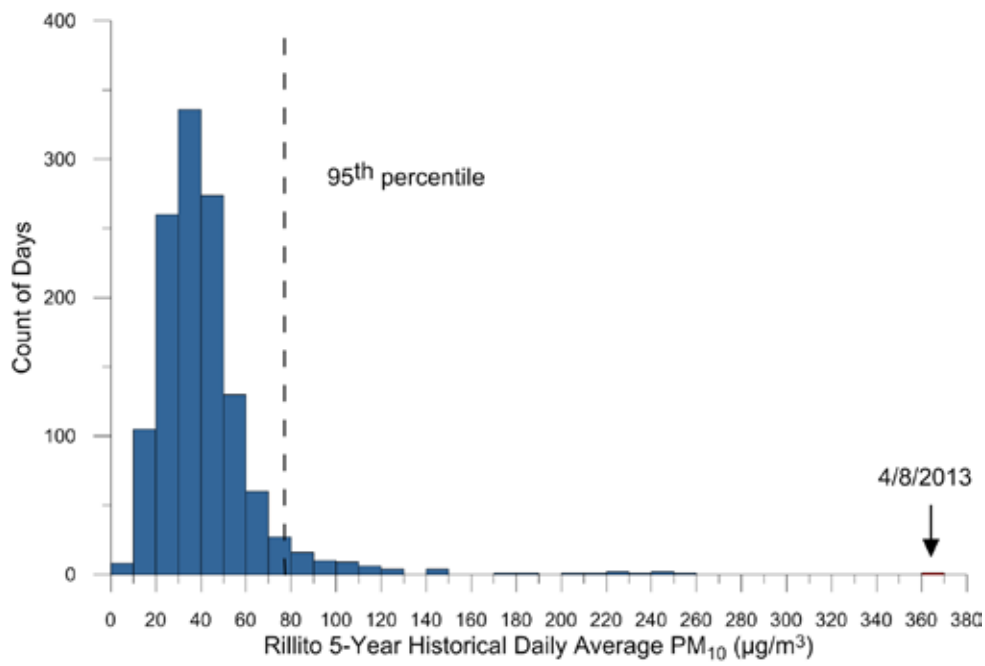

Figure 4-10. Histogram of 24-hr average PM_{10} concentrations at the Rillito monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over four times higher than the 95th percentile.

4.1.5 Hayden and Miami

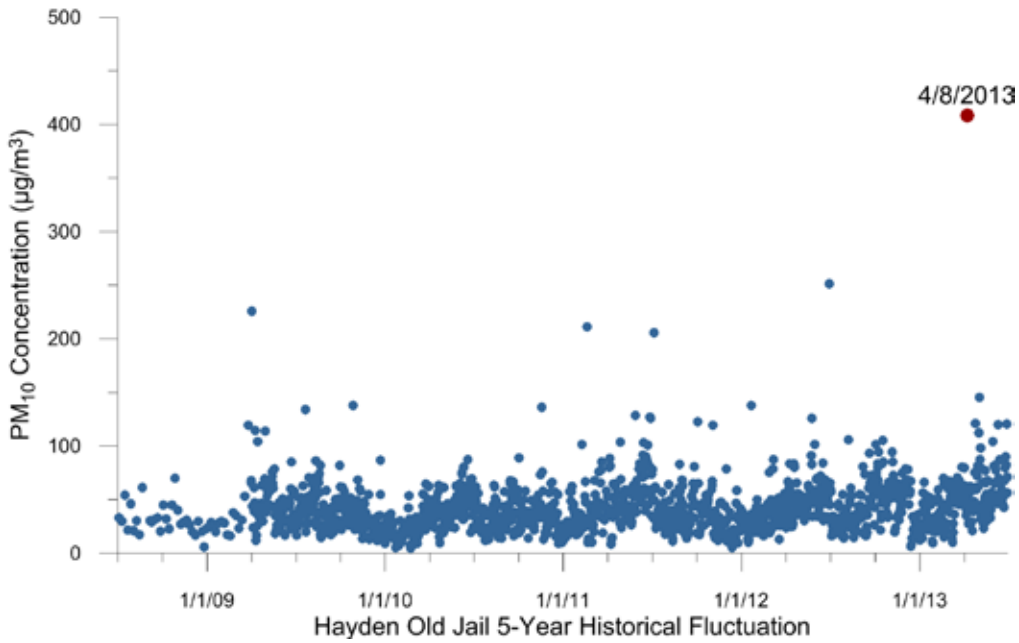

Figure 4-11. Scatter plot of 24-hr average PM_{10} concentrations at the Hayden Old Jail monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is in red. Prior to April 1, 2009, the Hayden monitor operated on a one-in-six day schedule.

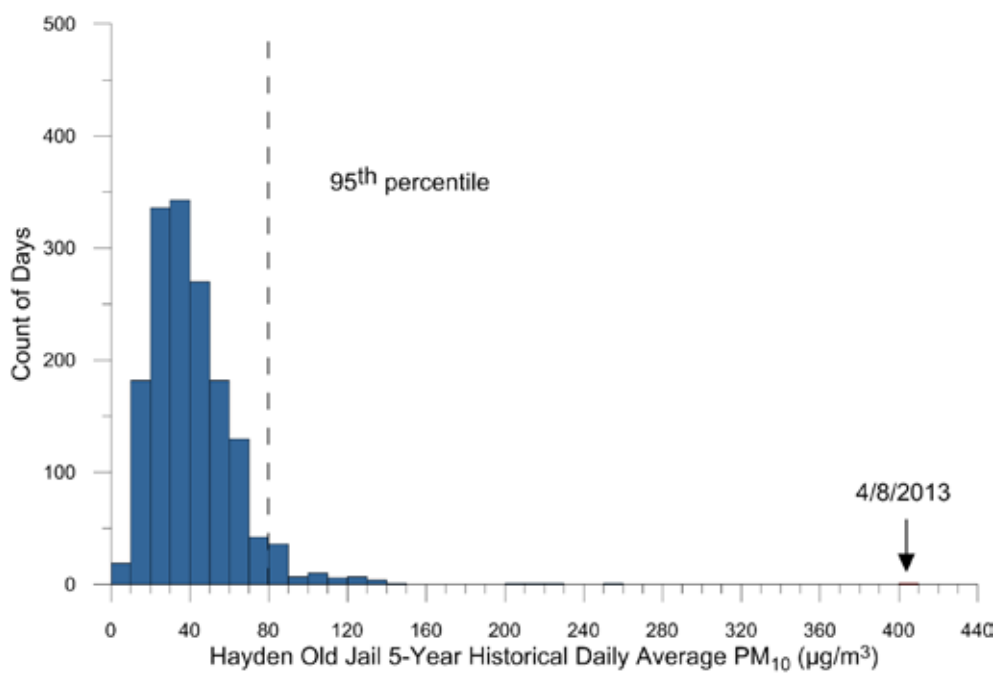

Figure 4-12. Histogram of 24-hr average PM_{10} concentrations at the Hayden Old Jail monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over five times higher than the 95th percentile.

4.1.6 Nogales

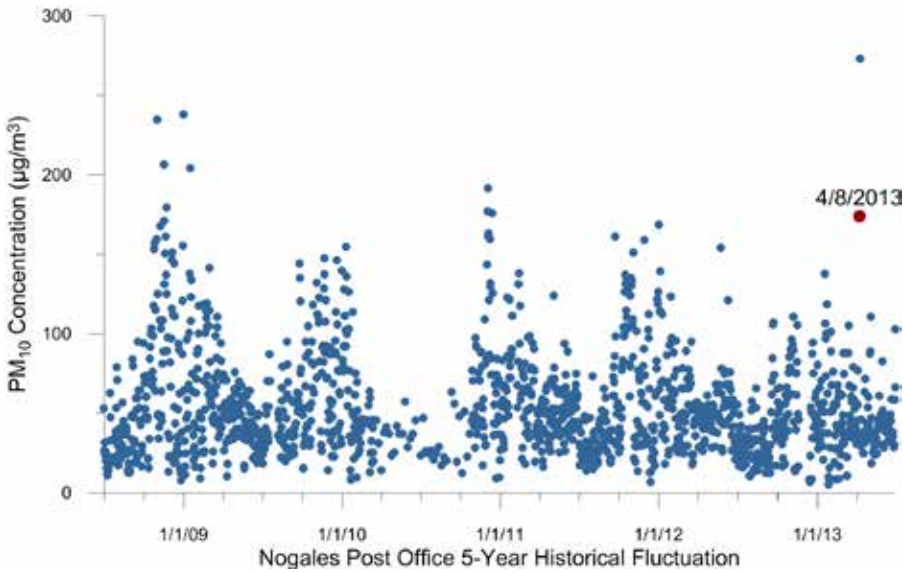

Figure 4-13. Scatter plot of 24-hr average PM_{10} concentrations at the Nogales Post Office monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is in red. Between March 16, 2010, and October 27, 2010, hourly PM_{10} concentrations collected at the Nogales Post Office monitor were flagged due to collection error, maintenance repairs, or poor quality assurance results. Here, we show 24-hr PM_{10} data collected on a one-in-six day schedule from a second Nogales Post Office monitor during this time period.

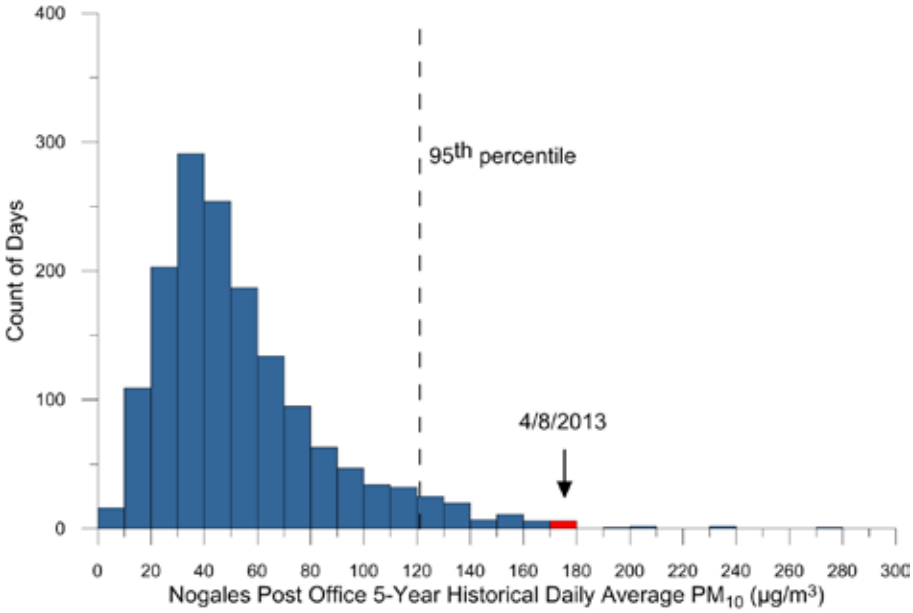

Figure 4-14. Histogram of 24-hr average PM_{10} concentrations at the Nogales Post Office monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, exceeded the 95th percentile.

4.1.7 Douglas

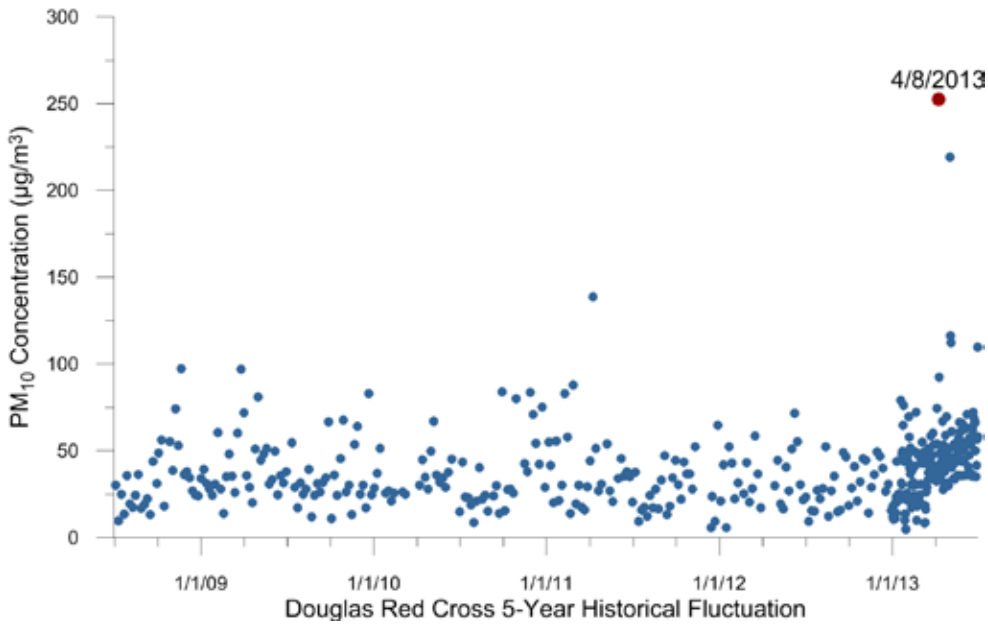

Figure 4-15. Scatter plot of 24-hr average PM_{10} concentrations at the Douglas Red Cross monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is in red. Prior to January 1, 2013, the Douglas Red Cross monitor operated on a one-in-six day schedule.

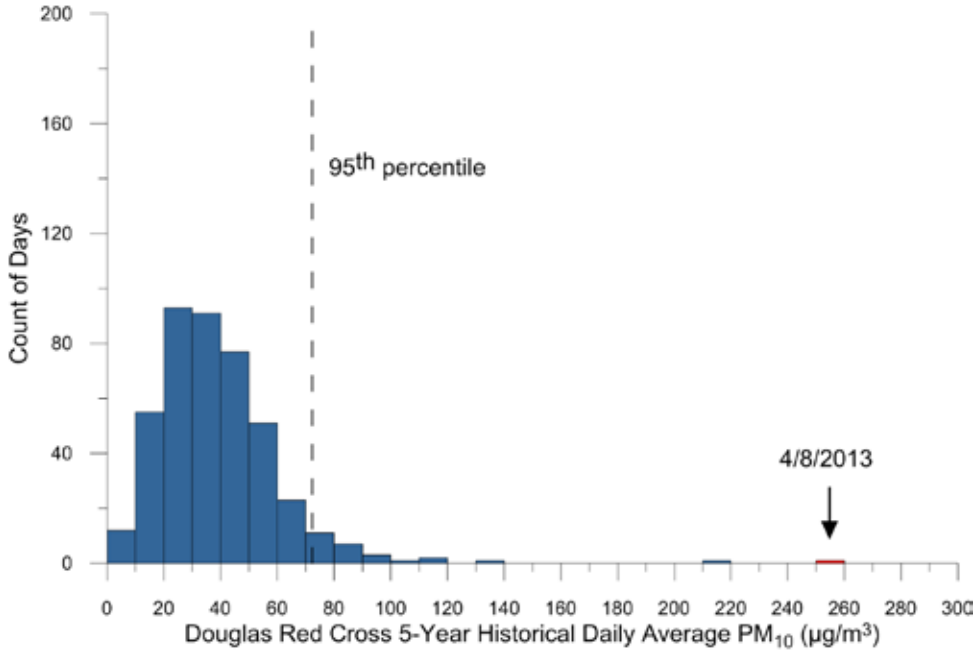

Figure 4-16. Histogram of 24-hr average PM_{10} concentrations at the Douglas Red Cross monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over three times higher than the 95th percentile.

4.2 Summary

Given the recorded values and using a methodology similar to the one accepted by EPA, it is clear that the PM_{10} levels on April 8 and 9, 2013, were outside normal historical fluctuations. This analysis provides evidence that the event affected air quality on a historic scale.

5. Not Reasonably Controllable or Preventable

This section summarizes forecasts and warnings released prior to the April 8 and 9, 2013, dust event, and wind observations collected during the event. It also describes the control measures and compliance and enforcement activities in place to achieve and/or maintain PM_{10} attainment during the April 8 and 9, 2013, dust event for each of the PM_{10} nonattainment regions in southern Arizona. A review of source-permitted inspections and public complaints, if any, for the days leading up to, during, and following the event are provided.

5.1 Forecasts and Warnings

Dust forecasts were released prior to the event by both ADEQ and the NWS offices in Phoenix and Tucson (Appendix D). The ADEQ forecasts stated that "a lengthy period of strong and gusty winds on Monday (April 8) as well as the potential for outflow from thunderstorms will contribute to a HIGH risk for dense blowing and transported dust along with unhealthy PM_{10} concentrations. Lingering suspended dust on Tuesday (April 9) may pose a risk for elevated PM_{10} levels." The NWS issued Wind Advisories and Blowing Dust Advisories due to the expected strong winds and windblown dust, warning of the potential for sustained winds of over 30 mph, wind gusts exceeding 50 mph, and visibilities as low as 0.25 miles due to blowing dust.

5.2 Wind Observations

Widespread sustained wind speeds of over 30 mph and wind gusts of over 50 mph were reported at southern Arizona monitoring sites during this windblown dust event. **Table 5-1** shows sustained wind speeds and wind gust speeds at NWS monitors in each of the nonattainment areas in southern Arizona on April 8. Winds of over 25 mph are normally sufficient to overcome most PM_{10} control measures.

Table 5-1. Peak observed wind speeds and wind gusts at NWS monitors across southern Arizona on April 8, 2013.

Monitor	Maximum Wind Speed (mph)	Wind Direction (degrees)	Time (MST)	Maximum Wind Gust (mph)	Time (MST)
Phoenix Sky Harbor (KPHX)	29	230	15:51	38	17:24
Yuma MCAS (KNYL)	36	300	16:55	49	16:55
Tucson Int'l Airport (KTUS)	32	210 220	11:53 12:24	47	11:15
Nogales Airport (KOLS)	36	180	16:54	47	17:54
Bisbee Douglas Int'l Airport (KDUG)	39	210 200	16:03 18:56	51	15:56 16:03

5.3 Summary

The weather and air quality forecasts and observations outlined in this report demonstrate that gusty southwesterly winds generated by an approaching cold front caused uncontrollable PM_{10} emissions on April 8, 2013. Some of the PM_{10} emissions from April 8 remained suspended in the lower atmosphere through the morning of April 9, causing continued high PM_{10} concentrations at some monitors. RACM and BACM for each of the nonattainment areas are discussed through the remainder of this section of the report, and the RACM/BACM were in place at the time of the event. In addition, surface wind measurements were high enough across southern Arizona on April 8 to overwhelm most reasonable PM_{10} control measures.

5.4 Control Measures and Enforcement Activities

5.4.1 Maricopa County (Phoenix)

Summary

The BACM outlined in the Serious Area PM_{10} plan for the Maricopa County portion of the metropolitan Phoenix PM_{10} nonattainment area were in place at the time of the April 8 and 9, 2013 event. These control measures are required for areas designated as serious nonattainment for PM_{10}, such as Maricopa County. Thus, the BACM in place at the time of the event were reasonable. In addition, surface wind measurements in the Phoenix area on April 8 were high enough (up to 29 mph at Phoenix Sky Harbor International Airport, with gusts of up to 38 mph) that most reasonable PM_{10} control measures would have been overwhelmed.

Background

ADEQ and MCAQD are responsible for implementing regulatory measures to control emissions from agricultural sources, stationary sources, fugitive dust sources, and open burning within Maricopa County. Three major programs provide or contribute to air pollution control measures for the Greater Phoenix area. These programs include

- ADEQ's Agricultural Best Management Program (Ag BMP)
- Maricopa County's Inspection and Compliance Program
- ADEQ's Air Quality Forecasting Program

Specifically, ADEQ is responsible for compliance assistance and enforcement of the Ag BMP developed by the Governor's Ag BMP Committee, while MCAQD is responsible for compliance assurance for all other significant sources of PM_{10} emissions. In addition to routine inspections and inspections driven by complaints, inspections are often increased when (1) ADEQ forecasters issue a Maricopa County Dust Control Forecast of "High Risk," or (2) ADEQ forecasters issue a High Pollution Advisory, or (3) near-real-time monitoring data indicate unique activity via high PM concentrations. The forecasting program and inspection/compliance programs work together so that resources can be best utilized during days of greatest risk for elevated PM emissions.

On July 25, 2002, EPA took initial action to finalize approval of the BACM and the Most Stringent Measure (MSM) demonstrations in the Serious Area PM_{10} plan for the Maricopa County portion of the metropolitan Phoenix PM_{10} Nonattainment Area (67 FR 48718). These BACM and MSM demonstrations were again approved by EPA on July 14, 2006 (71 FR 43979). The Ag BMP General Permit rule and related definitions have been adopted into the Arizona Administrative Code as R18-2-610 and R18-2-611, pursuant to Arizona Revised Statutes §49-457.[4]

Control Measures

Maricopa County regulations of PM_{10} emissions are listed in **Table 5-2**.

Table 5-2. Rules and ordinances regulating PM emissions in Maricopa County.

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Rule	Description
Rule 300: Visible emissions	Establishes standards for visible emissions and opacity.
Rule 310: Fugitive dust from dust-generating operations	Establishes limits for the emissions of particulate matter into the ambient air from any property, operations, or activity that may serve as a fugitive dust source.
Rule 310.01: Fugitive dust from non-traditional sources of fugitive dust	Establishes limits for the emissions of particulate matter into the ambient air from open areas, vacant lots, unpaved parking lots, and unpaved roadways which are not regulated by Rule 310 and which are not required to have either a permit or a dust control plan.
Rule 311: Particulate matter from process industries	Establishes emission rates based on process weight applicable to any affected operations not subject to Rule 316.
Rule 312: Abrasive blasting	Establishes limits for particulate emissions from abrasive blasting operations.
Rule 314: Open outdoor fires and indoor fireplaces at commercial and institutional establishments	Establishes limits for the emissions of air contaminants produced from open burning.
Rule 316: Nonmetallic mineral processing	Establishes limits for the emissions of particulate matter into the ambient air from any nonmetallic mining operation or rock product processing plant.
Rule 317: Hospital/medical/infectious waste incinerators	Establishes limits for the emissions of air pollutants from medical waste incinerators.
Rule 322: Power plant operations	Establishes limits for the emissions of nitrogen oxides, sulfur oxides, carbon monoxide, and particulate matter from existing power plants and cogeneration plants.
Rule 323: Fuel burning equipment from industrial/commercial/institutional (ICI) sources	Establishes limits for the emissions of nitrogen oxides, sulfur oxides, carbon monoxide and particulate matter from ICI sources.
Rule 324: Stationary internal combustion (IC) engines	Establishes limits for the emissions of carbon monoxide, nitrogen oxides, sulfur oxides, volatile organic compounds, and particulate matter from stationary internal combustion engines, including stationary IC engines used in cogeneration.
Rule 325: Brick and structural clay products (BSCP) manufacturing	Establishes limits for particulate matter emissions from the use of tunnel kilns for curing in the BSCP manufacturing processes.

[4] Updates to the Ag BMP program in December 2011 clarified BMPs for crops and added BMPs for animal operations. Effective 12/29/2011, R18-2-611 was renumbered to R18-2-610.01, **Agricultural PM_{10} General Permit for Crop Operations**, and R18-2-611.01, **Animal Operations PM_{10} General Permit**, was added. Definitions for Crop Operations were revised at R18-2-610 and new definitions for Animal Operations were added at R18-2-611.

Table 5-2. Rules and ordinances regulating PM emissions in Maricopa County.

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Rule	Description
Ordinance P-25: Leaf blower restriction	Establishes restrictions for leaf blowers in incorporated and unincorporated sections of Area A in Maricopa County.
Ordinance P-26: Residential wood burning restriction	Establishes restrictions for residential wood burning.
Ordinance P-27: Vehicle parking and use on unstabilized vacant lots	Establishes restrictions for vehicle parking and use on unstabilized vacant lots in unincorporated sections of Area A in Maricopa County.
Ordinance P-28: Off-road vehicle use in unincorporated areas of Maricopa County	Establishes restrictions for operating vehicles on unpaved property in unincorporated areas of Maricopa County.
Arizona Administrative Code R18-2-610 and R18-2-611: Agricultural PM_{10} general permit	Establishes a requirement for commercial farmers to implement best management practices and maintain a record demonstrating compliance.

Additional Measures

In addition to the rules and regulations listed in Table 5-2, other PM_{10}-reducing control measures (e.g., paving unpaved roads, PM_{10}-certified street sweepers, controlling unpaved parking lots, etc.) have been committed to and implemented by local jurisdictions throughout the PM_{10} nonattainment area and incorporated into the Arizona SIP through PM_{10} plans such as the Revised Maricopa Association of Governments' 1999 Serious Area Particulate Plan for PM_{10} for the Maricopa County Nonattainment Area. The PCAQCD also implements regulatory control measures on emissions from existing and new non-point sources within Pinal County (see **Table 5-3**). Additionally, the PCAQCD implements specific nonattainment rules for that part of the Phoenix PM_{10} Nonattainment Area that resides in Pinal County (see **Table 5-4**).

Table 5-3. Pinal County rules regulating existing and new non-point sources in Pinal County.

Article Number and Title	Description
Article 2: Fugitive dust	Provides a mechanism to reasonably regulate operations which periodically may cause fugitive dust emissions into the atmosphere.
Article 3: Construction sites – fugitive dust	Improves the control of excessive fugitive dust emissions that have been traditionally associated with construction, earthwork, and land development, and thereby minimize nuisance impacts.

Table 5-4. Pinal County rules regulating fugitive dust in the Pinal County portion of the Phoenix PM_{10} Nonattainment Area.

Article Number and Title	Description
Article 4: Nonattainment area rules; dustproofing for commercial parking, drives, and yards	Establishes rules to avoid violations of the prevailing PM_{10} standard and additionally minimize nuisance impacts by improving control of excessive fugitive dust emissions from unpaved parking lots.
Article 5: Nonattainment area rules; stabilization for residential parking and drives	Establishes rules for stabilizing residential properties.
Article 6: Restrictions on vehicle parking and use on vacant lots	Establishes rules for unpaved or unstable vacant lots.
Article 7: Construction sites in nonattainment areas – fugitive dust	Establishes rules to avoid violations of the prevailing PM_{10} standard and additionally minimize nuisance impacts by improving control of excessive fugitive dust emissions from activities associated with construction, earthwork, or land development.
Article 8: Nonattainment area rules, requirement for stabilization of disturbed areas at vacant lots	Establishes rules for stabilizing disturbed areas at vacant lots.

PM_{10} Rule Effectiveness

MCAQD analyzed the effectiveness of its fugitive dust rules (Rules 310, 310.01, and 316) in terms of source compliance rates. The rule effectiveness study was designed to assess how many sources regulated by MCAQD during the subject time period received no PM_{10} emissions-related violations. As a basis for comparison, the percentage of sources that did not receive a PM_{10} emissions-related violation during calendar year 2007 was 76% for sources subject to Rule 310, 85% for sources subject to Rule 310.01, and 40% for sources subject to rule 316. In early 2008, Rules 310, 310.01, and 316 were strengthened and new ordinances (covering additional source categories such as leaf blowers, vacant lots, and off-road vehicles) were adopted. These enhancements resulted from MCAQD's obligations under such agreements as the 2005 Revised PM_{10} SIP for the Salt River Area and MAG 2007 Five Percent Plan for PM_{10} for the Maricopa County Nonattainment Area. Three major aspects of these plans that contributed to increased compliance were an increase in departmental staffing (especially inspectors), a robust training program, and regulatory changes that broadened and strengthened control measures under Rules 310, 310.01, and 316.

Rule effectiveness rates were reassessed for FY 2009 (July 2008-2009), a period that allowed time for the new and revised regulations to take effect. The results showed significant increases in compliance compared with the earlier period: to 90% compliance (from 76%) for Rule 310 sources, 95% compliance (from 85%) for Rule 310.01 sources, and 65% compliance (from 40%) for Rule 316 sources. These improvements continued into calendar year 2010 with rule effectiveness rates of 94% for Rule 310 sources, 96% for Rule 310.01 sources, and 73% for Rule 316 sources.

Additional rule effectiveness increases were observed for Rule 310.01 and Rule 316 in calendar year 2012. The increase in rule effectiveness for Rule 310.01 was attributed to ADEQ's Dust Action General Permit, which was a new dust measured contained in the 2012

Five Percent Plan for the Maricopa County PM_{10} Nonattainment Area. The rule effectiveness for Rule 310.01 was 98%, an increase of 2% in 2012. The rule effectiveness for Rule 316 increased considerably to 83%, which is an increase of 10% compared to 2010.

The timeline shown in **Figure 5-1** illustrates the improvements in rule effectiveness over the last several years, and also points out significant revisions to previous rules, newly adopted rules, ordinances, and measures. Since the first study in 2007, the rule effectiveness has increased for Rule 310, Rule 310.01, and Rule 316 by 17%, 13%, and 43%, respectively.

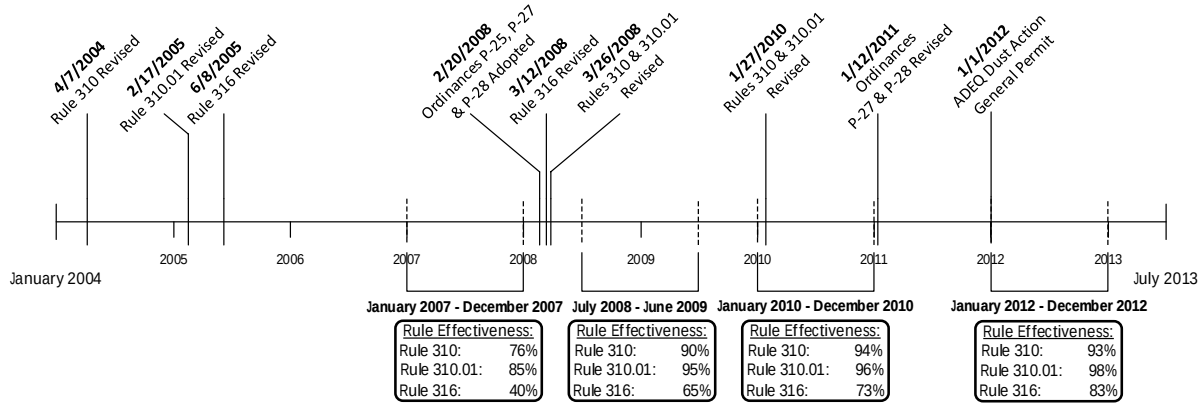

Figure 5-1. Timeline of Maricopa County fugitive dust rules and ordinances.

Compliance and Enforcement Activities

MCAQD is prepared to proactively respond to high wind events and protect human health and well-being. MCAQD's approach consists of two primary components: proactive inspections conducted routinely, as well as surveillance inspections conducted during and after significant air quality events. MCAQD routinely inspects dust control-permitted sites and increases the frequency of inspections for permits covering areas of 10 acres or more. MCAQD also regularly inspects Rule 316 sources multiple times every year. Maricopa County responds to the majority of complaints within 24 hours.

Maricopa County monitors the ADEQ Five-Day Dust Control Forecast to identify the potential for elevated PM_{10} pollution levels due to high winds or stagnant conditions. When a High Pollution Advisory (HPA) is issued for Maricopa County, MCAQD conducts increased surveillance before, during, and after the forecast event(s). MCAQD also conducts event surveillance and post-event activities during exceedance days that had not been forecast (i.e., those instances in which an HPA had not been issued).

Pre-event surveillance consists of surveying high-risk areas for any dust-generating activities, educating sources of the impending HPA event, and issuing violations for failure to comply with local, state, or federal regulations. During the event, MCAQD inspectors survey high-risk areas to confirm that control measures are in place, document any violations, and contact other regulatory agencies if necessary. Post-event activities include continued surveys

of high-risk areas, re-inspecting sources that had incurred violations within two business days, and an internal MCAQD debriefing of event activities.

During 2011, a total of 14 MCAQD air monitoring sites were upgraded with new equipment that allows the monitoring sites to automatically report measured readings at five-minute intervals. Previously, only hourly readings were available. The real-time data reporting system includes a mechanism to alert MCAQD field staff when PM concentrations are elevated. The system allows MCAQD responders to review concentrations at the monitors and to consult the National Weather Service website to check for weather event activity. With this capability, the MCAQD responder can identify regional events and monitor specific issues. If necessary, the MCAQD responders can inform nearby stakeholders and local governments of the elevated PM_{10} concentrations.

Review of Source-Permitted Inspections and Public Complaints

ADEQ compiled a list of inspections for the permitted sources in the Maricopa County area around the time of the April 8 and 9, 2013, PM_{10} exceedances. An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions on those days. During the period April 5 through April 11, 2013, MCAQD inspectors conducted a total of 217 inspections of permitted facilities, of which 167 were at fugitive dust sources. Additionally, MCAQD conducted 333 inspections on vacant lots and unpaved parking lots during this period. A total of 68 violations were issued county-wide related to PM_{10}. Three sources were issued violations related to PM_{10} within a 4-mile radius of an exceedance monitor. These three violations are described in the following paragraphs.

On April 8, a violation was issued to a fugitive dust source for track-out. The source was located 3.27 miles southwest of the Higley monitor. A MCAQD inspector arrived onsite at approximately 11:50 a.m., notified the source of the violation, and the source immediately began to clean up the track-out at approximately 12:05 p.m. The violation would not have affected the monitor because of the distance from the monitor to the source and how quickly the violation was resolved on April 8.

On April 8, a violation was issued to a fugitive dust source for failing to obtain an air quality permit. The source was located in downtown Phoenix and within a four-mile radius of the Central Phoenix, Greenwood, and Durango Complex monitors. The MCAQD inspector did not observe any violations that would have directly resulted in PM_{10} emissions. The source obtained a permit the following day (on April 9). The violation would not have contributed to the exceeding monitors because there were no violations that would directly result in PM_{10} emissions.

On April 9, four violations were observed at a stationary source near the Durango Complex monitor. The source is a mulching operation and received violations for visible emissions, not applying control measures as required by the source's permit, not applying water or dust suppressant prior to loading/unloading, and not applying water or dust suppressant during loading/unloading. The source was issued violations during the subsequent inspection. The source was within a four-mile radius of the Durango Complex, Greenwood, and West 43rd

Ave monitors. The violation would not have impacted the monitors because winds and PM_{10} concentrations had decreased by April 9 and no exceedances were recorded in Maricopa County on April 9.

In addition to MCAQD's efforts in pre-event surveillance and proactive inspections, ADEQ's Ag BMP inspector also monitors the ADEQ Five-Day Dust Control Forecast and the MCAQD air monitoring sites that include real-time data. The ADEQ Ag BMP inspector uses specific knowledge of seasonal activities and associations with the local growers and dairymen to communicate the importance of limiting dust-generating activities, especially during high wind events. Additional outreach is conducted with facility representatives prior to forecast high wind alert days. Should the PM_{10} readings at a MCAQD air monitoring site show a notable increase, the ADEQ Ag BMP inspector is dispatched to contact the owners and operators of agricultural fields in the area to discern whether their activities are causing negative impacts. The Ag BMP inspector is prepared to respond to most agriculture complaints within 24 hours.

5.4.2 Yuma

Summary

The RACM outlined in the Yuma PM_{10} Maintenance Plan were in place at the time of the April 8 and 9, 2013 event. These control measures are required for areas designated as moderate nonattainment for PM_{10}, such as Yuma County. Thus, the RACM in place at the time of the event were reasonable. In addition, surface wind measurements in the Yuma area on April 8 were high enough (up to 36 mph at Yuma Marine Corps Air Station, with gusts of up to 49 mph) that most reasonable PM_{10} control measures would have been overwhelmed.

Background

Yuma was designated as a moderate PM_{10} nonattainment area by operation of the 1990 CAA. The nonattainment area is defined in 40 CFR 481.303. ADEQ completed a SIP for the area in 1991; however, the plan was found incomplete, and in 1994, ADEQ updated the plan, identifying additional RACM. In 2001, due to several years of "clean data" and the existence of permanent and enforceable measures, ADEQ began the development of a maintenance plan and request for redesignation of the area to attainment. The maintenance plan was submitted to EPA in August 2006.

Control Measures

Details of the control measures implemented from 1994–2001 are in Appendix G of the 2006 Yuma PM_{10} Maintenance Plan. The control measures are listed in **Table 5-5**.

Table 5-5. Control measures implemented in the Yuma nonattainment area, 1994–2001.

Entity	Reasonably Available Control Measure
City of Yuma	Paving unpaved roads
	Closing unpaved roads
	Chemically stabilizing unpaved roads
	Paving or stabilizing parking lots
	Re-routing traffic or rapid cleanup of temporary sources of dust and spills
	Covering haul trucks
	Dust control plans for land clearing, construction projects
	Stabilizing soil; controlling dust on open lands
	Amending building codes
Town of Somerton	Re-routing traffic or rapid cleanup of temporary sources of dust and spills
	Covering haul trucks
	Dust control plans for land clearing, construction projects
	Stabilizing soil
Yuma County	Paving unpaved roads
	Stabilizing unpaved roads
	Re-routing traffic or rapid cleanup of temporary sources of dust and spills
	Covering haul trucks
	Open Burn Permit Program (rural metro)
Irrigation Districts	Reducing traffic on unpaved roads
Arizona Department of Transportation	Requiring contractors to adhere to local dust control plans

RACM for 2000 through 2004 can be found in Table 6.3 of the 2006 Yuma PM_{10} Maintenance Plan and are reproduced in part in **Table 5-6**. Chapter 7 of the Maintenance Plan also contains a list of contingency measures that could be implemented promptly should any violation of the NAAQS for PM_{10} occur.

Table 5-6. Yuma-area-implemented control measures, 2000–2004.

Entity	Reasonably Available Control Measure
City of Yuma	Pave unpaved roads
	Pave unpaved alleys
	Pave unpaved vacant land
	Chemically stabilize unpaved roads
	Water shoulders
	Street sweep paved roads
	Install curbs and sidewalks
	Landscape median
	Magnesium chloride on alleys
	Magnesium chloride on city property
Town of Somerton	Water unpaved roads
	Water unpaved shoulders
	Pave unpaved roads
	Weekly cleanup of paved roads, mud, trackout, spills
	Pave unpaved lots
	Landscape shoulders
	Install curbs
	Pave/stabilize unpaved roads
	Chip/seal
	Magnesium chloride on unpaved roads
	Street sweeping
Yuma County	Pave unpaved roads
	Developers add new paved roads
	Chip/seal unpaved roads
	Magnesium chloride unpaved roads
	Street sweeping
Immigration & Naturalization	Water drag roads
	Pipelined
	Maintain 350 “No Trespassing” signs and 50 barricades
	Patrol and water unpaved canal roads
	Posted/barricaded 3 miles
	Paved 2.5 miles
	Fenced off 2.5 miles
	Abandoned 3/8 mile
	Lined 8 miles of canal
N. Gila Irrigation District	20 miles posted
Unit B Irrigation District	Posted/barricaded 3 miles

Table 5-6. Yuma-area-implemented control measures, 2000–2004.

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Entity	Reasonably Available Control Measure
Bureau of Reclamation	Water 960 miles of canal banks
Marine Corps Air Station	Remove 26 gas vehicles
	Remove 25 gas scooters
	Pave 240,329-ft roadway
	Pave 102,112-ft parking
	Sweeping 717,221-yd runway
	Sweeping 388,952-yd taxiway
	Sweeping 401,090-yd aprons and 121,380-yd other
	Stabilize desert

In 2010, the Yuma Metropolitan Planning Organization (YMPO) updated the Transportation Improvement Plan (TIP) as required to comply with the requirements for transportation conformity under Section 176(c)(2) of the CAA. The update required a review of control measures included in the 2006 Yuma PM_{10} Maintenance Plan to assure that emissions were within the limits found in both plans for the current review years through the 2016 projected maintenance period. Yuma's plans related to transportation improvements can be found under "Plans and Reports" at http://www.ympo.org/.

Additional Measures

On August 18, 2002, Yuma recorded a 24-hr average PM_{10} concentration of 170 µg/m^3, which is in exceedance of the NAAQS. A NEAP was created to address and potentially implement any measures that could prevent future violations of the NAAQS. The option to develop a NEAP is no longer available; however, Yuma reviewed existing measures and developed additional measures that were later incorporated into the 2006 PM_{10} Maintenance Plan. These included

1. a public notification and education program, still in place today, and augmented recently by a pilot flag program for public schools and facilities based on the Yuma Dust Control Action Forecast (Appendices D, E, and F of the 2006 PM_{10} Maintenance Plan);
2. an analysis of BACM normally reserved for serious nonattainment areas; and
3. a review of existing control measures for construction sources, street sweepers, paved roads, covered trucks, off-highway vehicles, stationary source opacity limits, other stationary source control measures, and agricultural best management practices (Appendix H of the 2006 PM_{10} Maintenance Plan).

In 2002, ADEQ met with Yuma stakeholders and began work on the development of a Yuma Ag BMP rule. The rule became effective July 18, 2005, as R18-2-613 of the Arizona Administrative Code, and was submitted to EPA on August 16, 2006.

Review of Source Permitted Inspections and Public Complaints

ADEQ's AZURITE database was queried to compile a list of inspections for the permitted sources in the Yuma area around the time of the April 8 and 9, 2013, PM_{10} exceedances. An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions.

5.4.3 Ajo

Summary

In 2006, EPA found that RACM are no longer required for the Ajo nonattainment area. Surface wind measurements in the Ajo area on April 8 were high enough (up to 25 mph, with gusts exceeding 40 mph) to produce dusty conditions.

Background

Ajo was designated as a moderate PM_{10} nonattainment area by operation of the 1990 CAA. In 2006, following several years of improved air quality, EPA determined that the ANA had met the PM_{10} NAAQS and issued a clean data finding for the ANA. EPA's Clean Data Policy relieves the State from certain demonstrations of attainment, since qualifying for a clean data finding indicates that attainment has already been achieved. According to the 2006 EPA finding, Ajo was able to attain the PM_{10} NAAQS without any additional RACM being implemented. As a result, EPA found that, for the same reason the attainment demonstration no longer applies, the requirement for RACM no longer applies in the ANA.

Review of Source-Permitted Inspections and Public Complaints

ADEQ's AZURITE database was queried to compile a list of inspections for the permitted sources in the Ajo area around the time of the April 8 and 9, 2013, PM_{10} exceedances. An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions.

5.4.4 Rillito/Pima County

Summary

The RACM outlined in the Rillito Nonattainment Area PM_{10} Limited Maintenance Plan and Request for Redesignation to Attainment were in place at the time of the April 8 and 9, 2013 event. These control measures are required for areas designated as moderate nonattainment for PM_{10}, such as Rillito. Thus, the RACM in place at the time of the event were reasonable. In addition, surface wind measurements in the Rillito area on April 8 were high enough (up to 32 mph at Tucson International Airport, with gusts of up to 47 mph) that most reasonable PM_{10} control measures would have been overwhelmed. Residual suspended dust from a large dust plume caused continued high PM_{10} concentrations on April 9 despite lower wind speeds.

Background

Rillito was designated as a moderate PM_{10} nonattainment area by operation of the 1990 CAA. In 2006, following several years of improved air quality, EPA determined that the RNA had met the PM_{10} NAAQS and issued a clean data finding for the RNA. EPA's Clean Data Policy relieves the State from certain demonstrations of attainment, since qualifying for a clean data finding indicates that attainment has already been achieved. This section of the exceptional events demonstration describes the RACM implemented to bring the RNA into attainment and maintain attainment status.

Control Measures

Details of the RACM implemented in the RNA can be found in the 2008 RNA PM_{10} LMP and Request for Redesignation to Attainment. The 1994 SIP submitted to EPA contained a series of control measures designed to mitigate PM_{10} emissions. Since then, the RNA has become more urbanized and less agricultural. Thus, some of the control measures included in the 1994 SIP have been discontinued or were one-time actions. **Table 5-7** provides the status of these measures.

Table 5-7. Status of control measures implemented in the RNA from the 1994 Rillito PM_{10} SIP.

Measure	Details	Current Status
1. CalPortland Cement Plant and Quarry operations	Comprehensive road stabilization plan to mitigate emissions	In effect, included in the CPC operating permit issued October 7, 2003
2. Pima County Grading Ordinance, Chapter 18.81 of the Pima County Zoning Code (January 2001)	Permits for earth moving require stabilization to mitigate fugitive emissions	In effect
3. Bank Stabilization of the Santa Cruz River	One-time control measure implemented in 1988 during the development of nearby residential neighborhoods	Complete
4. Reduced Tillage Program	United States Department of Agriculture (DOA) pilot program	Discontinued by US DOA
5. Dust Stabilization – Rillito Community	Approximately one mile total of dirt road segments within the community are now paved	Complete
6. Avra Valley Road Shoulder Dust Stabilization	Once per year, 2.5 miles of road shoulders will undergo blading and rolling, followed by application of magnesium chloride	In effect on an as-needed basis

The implementation of these measures helped bring the RNA into timely attainment of the 24-hour standard; thus, the measures meet the CAA requirement for RACM for moderate PM_{10} nonattainment areas. In addition to these RACM, the Arizona Department of Transportation's (ADOT) Standard Specification Section 810 mandates that State contractors

use a comprehensive series of control measures designed to mitigate airborne PM_{10} emissions during road construction projects.

Permanent and Enforceable Control Measures

The CAA requires that all types of maintenance plans demonstrate that measures credited with bringing an area into attainment are federally enforceable and continue into the future. Measures 1, 2, and 6 in Table 5-6 meet these requirements. Measure 4 was discontinued by the US DOA and was not replaced, and measures 3 and 5 are no longer necessary because the affected public roadways have since been paved.

New major emissions sources or major modifications to existing sources in nonattainment areas are subject to Arizona Administrative Code (AAC) R18-2-403 (Permits for Sources Located in Nonattainment Areas). After an area is redesignated, AAC R18-2-406 (Permit Requirements for Sources Located in Attainment and Unclassifiable Areas) will apply for any major source(s) within the maintenance area.

Contingency Measures

Section 175A of the CAA requires a maintenance plan's contingency provisions to be enacted should a violation of the PM_{10} standard occur following redesignation to attainment. EPA's memo, *Limited Maintenance Plan Option for Moderate PM_{10} Nonattainment Areas* (Lydia Wegman, August 9, 2001),[5] states that contingency measures do not have to be fully adopted at the time of redesignation, but that the LMP should identify measures to be implemented if necessary.

The State commits to act promptly if an exceedance of the area's design value occurs following redesignation to attainment. Specifically, the State commits to determine that an exceedance has occurred within six months of the end of the calendar year in which that exceedance occurred. The State also commits to identify and implement the appropriate control measure(s) needed to remedy the situation by the end of the same calendar year.

A redesignated area with an LMP is also required to annually recalculate the average design value for the area to determine whether the area has continued to qualify for an LMP. If, after performing the annual recalculation, the State determines that the area no longer qualifies for an LMP, the State will commit to take actions to reduce PM_{10} concentrations sufficiently to requalify for an LMP, or will prepare a Maintenance Plan.

Contingency Measure Trigger

The State will consider implementing the contingency measures featured in **Table 5-8** should an exceedance of the critical design value occur (CDV). In order to prevent an exceedance from occurring, ADEQ opted to identify a specific indicator, or trigger, if PM_{10} concentrations reach a level that signals an imminent exceedance. The trigger will be used by ADEQ to determine the need to implement contingency measures in order to prevent an exceedance.

[5] This EPA memo can be found at http://www.epa.gov/ttn/oarpg/t1/memoranda/lmp_final.pdf.

Table 5-8. Rillito area contingency control measures.

Contingency Measure	Implementing Entity
1. If any PM_{10} generating source within the maintenance area is found to be contributing to monitored readings above the LMP allowable limits, ADEQ will review existing air quality permits and/or applicable rules to identify additional control measures that may be needed. If a PM_{10} source does not have a permit, ADEQ will determine whether a permit and PM_{10} controls are needed.	ADEQ
2. Review and revise dust control measures for material storage piles to determine whether additional action is needed.	ADEQ
3. Pave any new unpaved public roads, vacant lots, and unpaved parking lots located in the PM_{10} maintenance area subject to limits of statutory authority.	Pima County
4. Review and, if necessary, revise existing grading ordinances.	Pima County
5. Reduce particulate matter by paving or stabilizing unpaved or unimproved shoulders and alleys.	Pima County and Town of Marana
6. Review and, if necessary, revise standards for installation and maintenance of landscaping and screening.	Pima County
7. Review and, if necessary, revise roadway maintenance practices following exceptional events.	Pima County

Per the LMP submitted in 2008, contingency measures will be considered if ambient concentrations reach 95% of the CDV. The current CDV for the RNA is 135 µg/m^3. The causes that activated the trigger will help the State to determine the appropriate contingency measure(s) to be implemented. ADEQ believes that identifying a trigger, although not required, will increase protection of public health and help assure that the area continues to qualify for an LMP.

Conformity

The Transportation Conformity Rule (40 CFR Parts 51 and 93) and General Conformity Rule (58 FR 63214; November 30, 1993) apply to nonattainment areas and maintenance areas operating under maintenance plans. Under transportation conformity rules, one way to demonstrate conformity is to indicate that expected emissions from planned actions are consistent with the emissions budget for the area. Emissions budgets in LMP areas can be treated as essentially non-constraining for the length of the maintenance period, because it is unreasonable to expect that an LMP area would experience so much growth during that period of time that a violation of the PM_{10} NAAQS would result. This does not exempt an LMP area from the need to affirm conformity, but it does allow the area to demonstrate conformity without following certain requirements. For transportation conformity purposes, EPA would most likely conclude that emissions in these areas do not require a cap for the duration of the maintenance period and, therefore, that a regional emissions analysis will not be required.

General conformity requires that non-transportation-based projects in areas that have nonattainment or maintenance plans submit a description of the project to the State. The description must show either that the project will not increase the relevant emissions for the area, or that specific control measures will be applied for the duration of the project in order to prevent increased emissions.

Review of Source-Permitted Inspections and Public Complaints

ADEQ's AZURITE database was queried to compile a list of public complaints and inspections for the permitted sources in the Rillito area around the time of the April 8 and 9, 2013, PM_{10} exceedances. Four public complaints were submitted on April 8 in regards to blowing dust near the Asarco, LLC, mining complex south of Tucson. An inspection of the site found the facility to be non-compliant with local regulatory requirements for dust emissions. However, given the widespread, strong winds across Arizona, and the fact that no monitors with PM_{10} exceedances were immediately downwind of the facility, it is highly unlikely that these dust emissions affected PM_{10} measurements at the exceedance monitors.

5.4.5 Hayden and Miami

Summary

The RACM outlined in the Hayden Nonattainment Area PM_{10} SIP were in place at the time of the April 8 and 9, 2013 event. These control measures are required for areas designated as nonattainment for PM_{10}, such as Hayden. Thus, the RACM in place at the time of the event were reasonable. In addition, surface wind measurements in the Hayden area on April 8 were high enough (over 20 mph, with gusts exceeding 40 mph) that most reasonable PM_{10} control measures would have been overwhelmed.

Background

Hayden-Miami was designated as a PM_{10} nonattainment area by operation of the 1990 CAA. EPA based its decision on emissions from copper mining facilities and high measurements of airborne particulate matter. In March 2007, EPA approved a boundary redesignation of the Hayden-Miami PM_{10} nonattainment area into two separate, but adjoining, PM_{10} nonattainment areas. Together, these two new PM_{10} nonattainment areas cover the same geographic area as the original Hayden-Miami PM_{10} nonattainment area. In the same ruling, EPA determined that the Miami nonattainment area met the PM_{10} NAAQS. This section of the exceptional events demonstration describes RACM identified in the 1987 PM_{10} SIP to bring the HNA into attainment.

Control Measures

The 1987 HNA PM_{10} SIP details source-specific PM_{10} control options and the measures selected to achieve and maintain NAAQS attainment in the HNA. **Table 5-9** lists these control strategies.

Table 5-9. Control measures and implementation strategies for the Hayden area.

Control Measure	Implementation Strategy
Control copper ore dust	Replace current scrubbers with fabric filter collectors and increase enclosure, hooding, and venting to dust collectors of the fugitive emissions sources for an overall estimated reduction of 90%.
Pave unpaved streets, roads, and alleys	Pave all significant unpaved roads and streets, including Kennecott Road and Canyon Drive, to reduce emissions from these sources an estimated 90%.
Add curbing to major paved streets	Add curbs and gutters to main streets to limit soil intrusion. This will reduce street dust loading by an estimated 50%.
Reduce locomotive emissions	Modify and maintain locomotive engines in accordance with established diesel engine particulate emission control procedures to reduce emissions from the source category by approximately 60%.
Control gypsum dust sources	Install control systems (e.g., enclosure and vent to fabric filter collector) to reduce gypsum dust sources by an estimated 90%.

Review of Source-Permitted Inspections and Public Complaints

ADEQ's AZURITE database was queried to compile a list of inspections for the permitted sources in the Hayden area around the time of the April 8 and 9, 2013, PM_{10} exceedances. An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions.

5.4.6 Nogales

Summary

The RACM outlined in the Nogales Nonattainment Area SIP were in place at the time of the April 8 and 9, 2013 event. These control measures are required for areas designated as moderate nonattainment for PM_{10}, such as Nogales. Thus, the RACM in place at the time of the event were reasonable. In addition, surface wind measurements in the Nogales area on April 8 were high enough (up to 36 mph at Nogales Airport, with gusts of up to 47 mph) that most reasonable PM_{10} control measures would have been overwhelmed. A large dust plume generated by strong winds in southeastern California, southwestern Arizona, and far northwestern Mexico on April 8 moved into the Nogales area early on April 9. Residual suspended dust from this dust plume caused high PM_{10} concentrations in Nogales on April 9 despite lower wind speeds.

Background

Nogales was designated as a moderate PM_{10} nonattainment area by operation of the 1990 CAA. ADEQ completed a SIP for the area in 1993, followed by a replacement SIP in

2012. This section of the exceptional events demonstration describes RACM and reasonably available control technology (RACT) implemented to bring the NNA into attainment and maintain attainment status.

Control Measures

Details of the RACM implemented in the NNA can be found in the 2012 SIP for the NNA. The original SIP submitted to EPA in 1993 contained a series of control measures designed to mitigate PM_{10} emissions based on sources identified in the emission inventory. The 1993 NNA SIP identified emissions from unpaved roads as the greatest source of PM_{10} emissions generated in the NNA. In the more recent 2008 emission inventory, no new major sources of PM_{10} were identified. As a result, ADEQ found that the control measures described in the 1993 NNA SIP are still appropriate for the NNA. Note that some of the 1993 control measures are not included in the 2012 SIP because they cannot be enforced by the state.

Control Measures Adopted into the SIP and Implemented by ADEQ

Control measures that have been included in the SIP and implemented by ADEQ include the following:

1. Requiring RACT for stack and fugitive PM_{10} from permitted stationary sources;
2. Requiring RACT for haul roads and staging areas;
3. Requiring dust control measures for material storage piles; and
4. Limiting use of recreational vehicles on open land.

Require RACT for Stack and Fugitive PM_{10} from Permitted Stationary Sources/Require RACT for Haul Roads and Staging Areas

In the 1993 NNA SIP, ADEQ committed to implement the RACM/RACT for stack and fugitive emissions from permitted stationary sources, haul roads and staging areas, and material storage piles. The sources permitted by ADEQ shown in **Table 5-10** were in operation during 2008. With the exception of the UNS Electric facility, which operates under a Title V permit, the sources operate under one of ADEQ's general permits that require RACM/RACT appropriate for the source. In addition, Arizona Administrative Code R18-2-702, effective February 3, 2004 (69 FR 51592; August 28, 2004), establishes a 20% opacity standard for point sources in all moderate PM_{10} nonattainment and maintenance areas, including the NNA, and qualifies as RACM. EPA states, "Where the sources affected by a particular measure contribute only negligibly to ambient concentrations that exceed the NAAQS, EPA's policy is that it would be unreasonable and therefore would not constitute RACM to require controls on the source." Emissions from permitted sources meet these criteria and, therefore, do not require RACM.

Table 5-10. PM_{10} generating point sources operating in the NNA in 2008 and PM_{10} emissions in tons per year (TPY).

Source	Description	PM_{10} TPY	Type
County Health Department	Boilers and Generators	0.019	Stationary
AT&T	Generator	0.002	Stationary
Steris Inc.	Medical Device Sterilization	N/A	Stationary
UNS Electric Inc.	Utilities – Natural Gas	0.610	Stationary
Wash and Clean World	Dry Cleaners	0.011	Stationary
CEMEX Construction Materials South	Concrete Batch Plant	1.662	Movable
	Total	2.3	

Require Dust Control Measures for Material Storage Piles

Arizona Administrative Code R9-3-407, approved into the Arizona SIP by EPA April 23, 1982 (47 FR 17485), prescribes the following requirements for storage piles:

1. No person shall cause, suffer, allow, or permit organic or inorganic dust producing material to be stacked, piled, or otherwise stored without taking reasonable precautions such as chemical stabilization, wetting, or covering to prevent excessive amounts of particulate matter from becoming airborne.
2. Stacking and reclaiming machinery utilized at storage piles shall be operated at all times with a minimum fall of material and in such manner, or with the use of spray bars and wetting agents, as to prevent excessive amounts of particulate matter from becoming airborne. ADEQ officials are authorized to issue citations for violating the law.

Limit Use of Recreational Vehicles on Open Land

The City of Nogales is well-developed and city officials confirm there are no open public areas where off-highway vehicles (OHVs) can be used within the city's borders. The prohibition on OHV use is enforced by local law enforcement agencies. Portions of the NNA with open areas are subject to Arizona Administrative Code R9-3-404 – Open Areas, Dry Washes, or Riverbeds, approved into the Arizona SIP on October 19, 1984 (49 FR 41026), which establishes that "No person shall operate a motor vehicle for recreational purposes in a dry wash, riverbed or open area in such a way as to cause or contribute to visible dust emissions which then cross property lines into a residential, recreational, institutional, educational, retail sales, hotel or business premises. For purposes of this subsection 'motor vehicles' shall include, but not be limited to trucks, cars, cycles, bikes, buggies and 3-wheelers. Any person who violates the provisions of this subsection shall be subject to prosecution under A.R.S. § 49-463." Enforcement of the law is provided by Arizona Department of Public Safety officers, sheriffs, police, and State and federal land managers. Violations of the law may lead to penalties reaching $500.

Status of 1993 NNA SIP Control Measures Implemented by the City of Nogales and/or Santa Cruz County Meeting RACM

This section provides a status report on the control measures included in the 1993 NNA SIP implemented by the City of Nogales and Santa Cruz County. These measures were included in the 2012 SIP revision and continue to be enforceable and implemented.

Pave or Chemically Stabilize Unpaved Roads; Pave, Vegetate or Chemically Stabilize Access Points Where Unpaved Traffic Surfaces Adjoin Paved Roads

All public roads in the City of Nogales have been paved and accepted into the City's Street Maintenance Program; therefore, there are no unpaved/paved road access points between adjoining public roads. Santa Cruz County officials confirm that the portions of Rio Rico within the NNA's boundaries include approximately 200 miles of paved/double chip-sealed roads and approximately 40 miles of unpaved roads.

Between 1992 and 2008, 17.5 combined miles of roadway were paved or double chip-sealed in the Rio Rico and Nogales portions of the NNA. Within the 1993 NNA SIP, the City of Nogales committed to pave several roadways within the city limits by 1998. In an implementation review using aerial photography, ADEQ identified eleven unpaved roads that were paved between 1992 and 1996, totaling 8.4 miles. Because traffic data could not be located for two of the eleven roadways (Hohokam and La Quinta Roads), emission reductions were not calculated for them. For the remaining nine unpaved roads, totaling 7.7 miles, the annual emission reduction associated with their paving was estimated to be 78.45 tons of PM_{10} per year (**Table 5-11**).

Table 5-11. Annual estimated PM_{10} emissions for roads in the City of Nogales, Arizona, 1993−1996.

Road	Miles Paved	Vehicle Miles Traveled	Unpaved Emissions (tons)	Paved Emissions (tons)
Royal Rd	0.9	16,178	4.55	0.0086
Vista del Cielo	2.2	160,072	45.06	0.0848
Yucca Drive S.	2.0	13,696	3.86	0.0073
Bristol Drive	0.4	7,875	2.22	0.0042
Frank Reed Rd	0.95	62,616	17.63	0.0332
Kino Rd	0.28	3,835	1.08	0.0020
Kelsey Rd	0.27	6,204	1.76	0.0033
West 1st St	0.4	6,848	1.93	0.0036
Target Range Rd	0.2	1,294	0.36	0.0007
Total	**7.7**	**278,655**	**78.45**	**0.148**

In a similar implementation review using aerial photography and data provided by Santa Cruz County, ADEQ reviewed 39.8 miles of road paving/double chip-sealing completed by Santa Cruz County in the Rio Rico community in and around the NNA between 2002 and 2008. Of those roads, ADEQ identified four unpaved roads within the NNA totaling 9.75 miles, as shown in **Table 5-12**. The annual emission reductions associated with the paving of these four unpaved roads was estimated to be 107.4 tons of PM_{10} per year. While there was an additional estimated 40 miles of paving/double chip-sealing projects on unpaved roads in the Rio Rico community between 1994 and 2001, Santa Cruz County could not locate records detailed enough to allow ADEQ to calculate emission reductions for the subset of these projects located in the NNA. As a result, ADEQ did not claim emissions reductions for these projects.

Table 5-12. Annual estimated PM_{10} emissions for roads in Rio Rico within the NNA, 2002−2008.

Roadway	Miles Paved	Vehicle Miles Traveled	Unpaved Emissions (tons)	Paved Emissions (tons)
Calle Arikara	1.09	22,694	5.9	0.011
Paseo Mexico	4.03	195,774	35.5	0.067
Calle Coyote-Annette Ct	1.92	65,679	18.5	0.035
Paseo Guebabi	2.70	168,746	47.5	0.089
Total	**9.75**	**452,893**	**107.4**	**0.202**

ADEQ found that, typically, intersections provide adequate stabilization of unpaved roads to mitigate trackout on paved and unpaved road intersections (2012 State Implementation Plan, Nogales PM_{10} Nonattainment Area, July 23, 2012). As part of preventing trackout on to paved roads, Section 8-8-2, Streets, of the City of Nogales Code requires curbing of paved roads and Section 8-9-5, General Parking Lot Design Requirements, requires paving of commercial parking lots; these measures were not included for submittal in the 2012 SIP or for consideration as RACM.

Control Measures Implemented by Agencies But Not Included in the SIP for Credit

The control measures in this section provide additional emissions reductions in the NNA that are not claimed for credit.

General Services Administration (GSA) Reduce Idling Time of Diesel-Powered Vehicular Traffic at Border Entrances

By 1994, the GSA expanded the number of northbound vehicle lanes at the DeConcini Port of Entry (POE) from four to eight, and added three northbound lanes at the Mariposa POE. These actions provided supplemental reductions in exhaust and brake wear emissions, vehicle stops and starts, and idling time.

Provide for Storm Water Drainage to Prevent Soil Erosion onto Paved Roads/Provide for Traffic Rerouting or Rapid Clean Up of Temporary Sources of Dust on Paved Roads

Two problem storm drainage areas in the City of Nogales identified in the 1993 NNA SIP (Meadow Hills and Yucca Drive) were repaired with box culverts and paved with concrete. The City of Nogales and Santa Cruz County each own two standard street sweepers; maintenance is performed on a 5-day, 40-hour weekly basis. Santa Cruz County implemented an on-call program for Public Works Department employees to be on standby after normal working hours to respond to road emergencies and/or road blockage following storms. Public Works crews immediately clean up after every storm by removing debris and sweeping roads. The City of Nogales and Santa Cruz County have procedures to prevent storm water and soil from flooding city streets.

Prohibit Permanent Unpaved Haul Road, and Parking or Staging Areas at Commercial, Municipal, or Industrial Facilities

The City of Nogales and Santa Cruz County have developed regulations that prohibit permanent unpaved haul roads and parking or staging areas at commercial, municipal, and industrial facilities.

Require Haul Trucks To Be Covered

Arizona Revised Statute 28-1098, effective September 19, 2007, requires that, “For the purpose of highway safety or air pollution prevention, a person shall not drive or move a vehicle on a highway unless the vehicle is constructed or loaded in a manner to prevent any of its load from dropping, sifting, leaking or otherwise escaping from the vehicle...A person shall not operate a vehicle on a highway with a load unless the load and any covering on the load are securely fastened in a manner to prevent the covering or load from becoming loose, detached or in any manner a hazard to other users of the highway.” Department of Public Safety deputies and local law enforcement officials are authorized to issue citations to those violating the law.

Review of Source-Permitted Inspections and Public Complaints

ADEQ’s AZURITE database was queried to compile a list of inspections for the permitted sources in the NNA around the time of the April 8 and 9, 2013, PM_{10} exceedances. An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions.

5.4.7 Douglas

Summary

The RACM outlined in the 1993 Douglas PM_{10} SIP were in place at the time of the April 8 and 9, 2013 event. These control measures are required for areas designated as moderate nonattainment for PM_{10}, such as Douglas. Thus, the RACM in place at the time of the event were reasonable. In addition, surface wind measurements in the Douglas area on April 8 were

high enough (up to 39 mph at Douglas Airport, with gusts of up to 51 mph) that most reasonable PM_{10} control measures would have been overwhelmed.

Background

Douglas was designated as a moderate PM_{10} nonattainment area by operation of the 1990 CAA. In 1989, in response to several exceedances of the PM_{10} standard, a special PM_{10} study was conducted for the Douglas area to determine temporal and spatial variation of PM_{10}. Special attention was given to the possible transport of PM_{10} emissions from Mexico to the Douglas area. Two temporary samplers were set up; one was located in Douglas near the United States/Mexico border, and the other sampler was operated in a near-field background setting outside Douglas, at the Cochise County Fairgrounds. Wind instruments were also operated at the border sampler site and a time lapse camera was used to photograph the border area from the roof of a downtown Douglas hotel. Higher PM_{10} concentrations were recorded near the United States/Mexico border, presumably due to greater PM_{10} emissions in the adjacent town of Agua Prieta (in Mexico).

A PM_{10} emissions inventory was assembled for the DNA by Engineering-Science, Inc. in October 1987. The study disclosed that emissions from unpaved roads, alleys, and parking lots account for a majority of the PM_{10} totals, followed by agricultural activities, re-entrained fugitive emissions from paved streets and roads, windblown dust, and wood burning. Although the inventory does not adequately address emissions from Agua Prieta, Agua Prieta had few paved streets and is believed to contribute almost all of the unpaved road emissions. The emissions inventory for the Douglas/Agua Prieta Planning Area indicated that 40% of the pollution sources were on the United States side of the border, and 60% were on the Mexico side. The study concluded that paving, curbing, and vegetating or paving adjacent areas would reduce unpaved road, alley, and parking lot emissions by an estimated 90%; and that additional curbing and paving or vegetating of adjacent areas and a program of street washing may reduce paved street emissions by as much as 60%.

The 1990 CAA required that a SIP for an international border area demonstrate attainment and maintenance of the PM_{10} NAAQS by the federally mandated attainment date of December 31, 1994, if not for emissions emanating outside of the United States. In the 1993 Douglas PM_{10} SIP, ADEQ suggested that strategies undertaken on the United States side of the planning area would be enough to make this demonstration, but that PM_{10} NAAQS violations would likely continue because of the absence of PM_{10} emissions control in Mexico. The remainder of this section of the exceptional events demonstration describes RACM implemented to bring the DNA into attainment and maintain attainment status.

Control Measures

Fugitive dust emissions are dependent upon several factors, such as the size of the source, emission rate, and control efficiency. The EPA has developed a list of fugitive dust control strategies. The complete list of EPA-defined RACMs was evaluated by ADEQ and the control measures for the DNA, outlined in the 1993 Douglas PM_{10} SIP, are listed in **Table 5-13**.

Table 5-13. Control strategies implemented in the DNA since May 1989.

Control Measure	Responsible Agencies
Control open burning	City of Douglas
Curb streets	City of Douglas; Cochise County
Control dust for material storage piles	Arizona Department of Transportation
Add four lanes at POE facility	U.S. General Services Administration/U.S. Customs Service
Landscape international border ditch	U.S. General Services Administration/U.S. Customs Service
Landscape natural drainage feature	U.S. General Services Administration/U.S. Customs Service
Pave unpaved parking lots	City of Douglas
Pave unpaved roads	City of Douglas; Cochise County; ADOT
Implement traffic reduction plans	U.S. Immigration and Naturalization Service
Ventilate primary lanes	U.S. General Services Administration/U.S. Customs Service
Add water misting system	U.S. General Services Administration/U.S. Customs Service

Review of Source-Permitted Inspections and Public Complaints

ADEQ's AZURITE database was queried to compile a list of inspections for the permitted sources in the Douglas area around the time of the April 8 and 9, 2013, PM_{10} exceedances. An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions.

6. But-For Analysis

6.1 Discussion

Section 50.14(c)(3)(iv)(D) in 40 CFR Part 50 requires that an exceptional event demonstration satisfies that "[t]here would have been no exceedance or violation but for the event." The prior sections of this submittal have provided detailed information that, in regard to the PM_{10} exceedances on April 8 and 9, 2013,

- The exceedances were not reasonably controllable or preventable,
- There was a clear causal relationship between PM_{10} lofted and transported by strong southwesterly winds originating in open desert areas on April 8 and the PM_{10} exceedances measured in each of the nonattainment areas discussed in this report, and
- A large dust plume generated by strong winds on April 8 caused continued high PM_{10} concentrations in southeastern Arizona early on April 9, despite lower wind speeds on April 9.

The weight of evidence in these sections demonstrates that, but for the existence of dust emissions generated by strong southwesterly winds ahead of a Pacific storm system and the associated transport of PM_{10}, there would have been no exceedances of the NAAQS for 24-hr average PM_{10}. The dust lofted by the strong winds remained suspended in the lower atmosphere for an extended period, resulting in continued high PM_{10} concentrations at some monitors even after winds diminished.

As shown in Section 3, time-series plots of PM_{10} and wind speeds establish a clear causal relationship between the arrival of dust-laden winds and elevated PM_{10} concentrations. Multiple independent measurements of wind speed, wind direction, and visibility all point to the presence of strong southwesterly winds as the mechanism for lofting and transport of PM_{10} into the PM_{10} nonattainment areas across southern Arizona. High PM_{10} concentrations and gusty winds were also reported in neighboring southeastern California, illustrating the regional nature of this event. In addition, PM_{10} concentrations were well below the NAAQS on days immediately before and after the windblown dust event. The source regions for the PM_{10} are identified as open desert areas of southern Arizona and northwestern Mexico, largely outside the boundaries of the PM_{10} nonattainment areas. The weight of evidence presented in this submittal provides no alternative that could tie the exceedances of April 8 and 9, 2013, to any causal source except PM_{10} lofted and transported by widespread, strong southwesterly winds, confirming that there would have been no exceedance but for the presence of these uncontrollable natural events.

As detailed in Section 5, all reasonable control measures were in place and/or implemented on a continual basis. Local regulatory agencies, industry, and the general public were alerted to the possibility of dust storms due to strong winds ahead of an approaching Pacific storm system via daily forecasts and media reports. Air quality-related inspection and compliance data revealed three violations near exceedance monitors in Maricopa County and one violation in Pima County. However, strong winds were reported throughout southern Arizona, and the exceedance monitors were not immediately downwind of the sources or

facilities responsible for the violations. Thus, it is highly unlikely that emissions from the sources or facilities with violations affected PM_{10} measurements at the exceedance monitors.

6.2 Summary

The weight of evidence presented in this submittal provides no alternative that could tie the exceedances of April 8 and 9, 2013, to any causal source except PM_{10} lofted and transported by strong southwesterly winds, confirming that there would have been no exceedance but for the presence of these uncontrollable natural events.

7. Conclusions

The PM_{10} exceedances that occurred on April 8 and 9, 2013, satisfy the criteria of the EER, which states that in order to justify the exclusion of air quality monitoring data, evidence must be provided for the following elements:

1. The event satisfies the criteria set forth in 40 CFR 50.1(j) that
    a. the event affected air quality,
    b. the event was not reasonably controllable or preventable, and
    c. the event was caused by human activity unlikely to recur in a particular location or was a natural event;
2. There is a clear causal relationship between the measurement(s) under consideration and the event;
3. The event is associated with a measured concentration(s) in excess of normal historical fluctuations; and
4. There would have been no exceedance or violation but for the event.

7.1 Affects Air Quality

As stated in the preamble to the EER, the event in question is considered to have affected air quality if it can be shown that there is a clear causal relationship between the monitored exceedances and the event, and that the event is associated with a measured concentration in excess of normal historical fluctuations. Given the information presented in Sections 2, 3, 4, and 5, we can reasonably conclude that the event in question affected air quality.

7.2 Not Reasonably Controllable or Preventable

Section 50.1(j) of 40 CFR Part 50 requires that an event must be “not reasonably controllable or preventable” in order to be defined as an exceptional event. This requirement is met by demonstrating that, despite reasonable control measures in place within the PM_{10} nonattainment areas, high winds overwhelmed all reasonably available controls. Inspections of anthropogenic sources of PM_{10} on April 8 and 9, 2013, found some violations of local PM_{10} emissions regulations; however, the nature of these violations and observed wind conditions at the time indicate that emissions from these sources likely did not impact PM_{10} measurements at nearby exceedance monitors. The PM_{10} exceedances discussed in this report were caused by naturally occurring strong southwesterly winds that lofted and transported dust into PM_{10} nonattainment areas across southern Arizona from open desert regions on April 8. Residual suspended dust caused continued high PM_{10} concentrations at monitors in southeastern Arizona early on April 9. These facts provide strong evidence that the PM_{10} exceedances on April 8 and 9, 2013, were not reasonably controllable or preventable.

7.3 Natural Event

As discussed above, the PM_{10} exceedances on April 8, 2013, were shown to be caused by transport of PM_{10} into the nonattainment areas by widespread, strong southwesterly winds ahead of a cold front. Residual suspended dust caused continued high PM_{10} concentrations in southeastern Arizona early on April 9, which resulted in additional exceedances. The event therefore qualifies as a natural event.

7.4 Clear Causal Relationship

The following points demonstrate that the high PM_{10} concentrations were caused by windblown dust:

- Time-series of PM_{10} concentrations show that the timing of high PM_{10} at monitors were consistent with gusty winds and low visibilities recorded at nearby meteorological stations (Section 3).
- High PM_{10} concentrations and gusty winds were reported at monitors across southern Arizona and southeastern California, illustrating the regional, uncontrollable nature of this event (Section 3).
- Visibility cameras depicted dust and low visibilities coincident with the period of high PM_{10} concentrations and strong winds (Section 3).
- PM_{10} concentrations were well below the NAAQS on days immediately before and after the windblown dust event (Section 3).
- Dry conditions preceding the event resulted in soils that were particularly susceptible to particulate suspension by high winds (Section 3).
- The NWS issued several Wind Advisories and Blowing Dust Advisories to warn the public of the potentially hazardous conditions (Section 3).
- A large dust plume originating in southeastern California, southwestern Arizona, and far northwestern Mexico moved eastward behind the cold front and into southeastern Arizona early on April 9, resulting in continued high PM_{10} concentrations at some monitors.

7.5 Historical Norm

The 24-hr average PM_{10} values at the exceedance monitors were historically unusual compared to a multi-year data set (Section 4).

7.6 But For

On the basis of the weight of evidence described above and in Section 6, the exceedances of the federal 24-hr PM_{10} standard on April 8 and 9, 2013, would not have occurred but for the period of strong southwesterly winds that lofted and transported dust from open desert areas into the PM_{10} nonattainment area.

Appendix A:
Statewide Air Quality and Meteorological Data

This section contains time-series plots of air quality and meteorological data in Arizona on April 8 and 9, 2013. The data show an increase in wind speeds and wind gusts coincident with the arrival of dust and high PM_{10} concentrations on April 8, followed by a period of high PM_{10} concentrations at some monitors early on April 9. The graphs are grouped by nonattainment area.

- Maricopa County (Phoenix) graphs start on this page
- Yuma graphs start on page A-26
- The Ajo graph is on page A-29
- Rillito/Pima County graphs start on page A-30
- The Hayden and Miami graph is on page A-37
- Nogales graphs are on page A-38
- Douglas graphs start on page A-39
- Quality-controlled local climatological data hourly observations tables start on page A-41

Maricopa County (Phoenix)

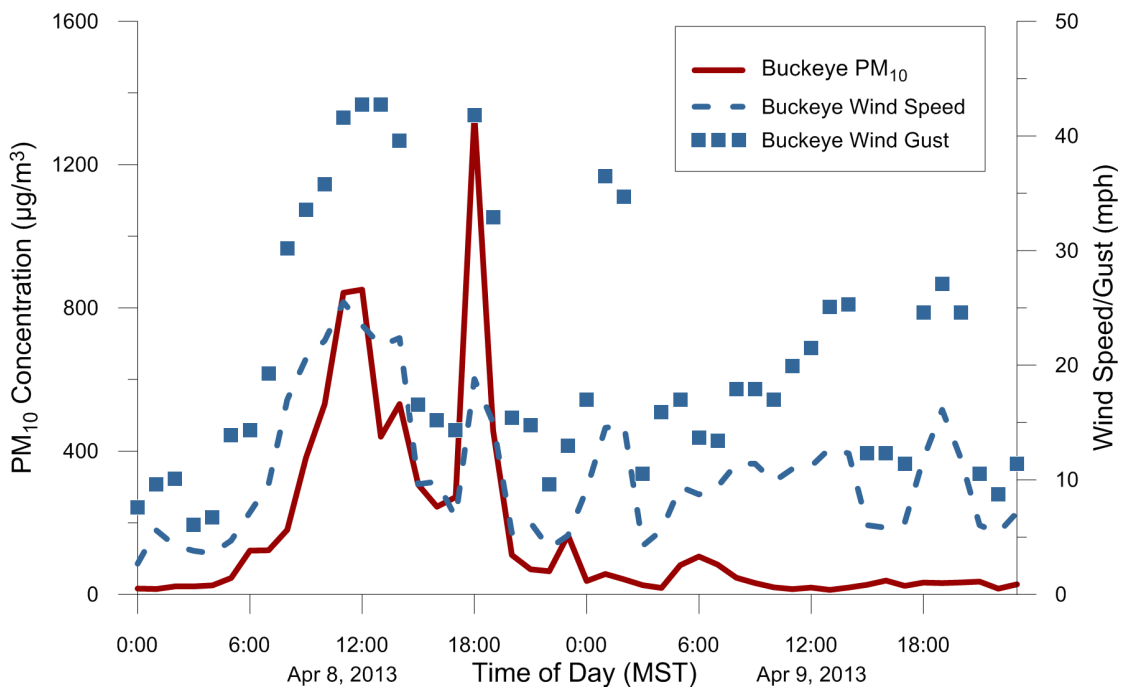

Figure A-1. Hourly PM_{10} concentrations and wind speeds at the Buckeye AQS monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 08:00 MST on April 8, indicating the presence of windblown dust.

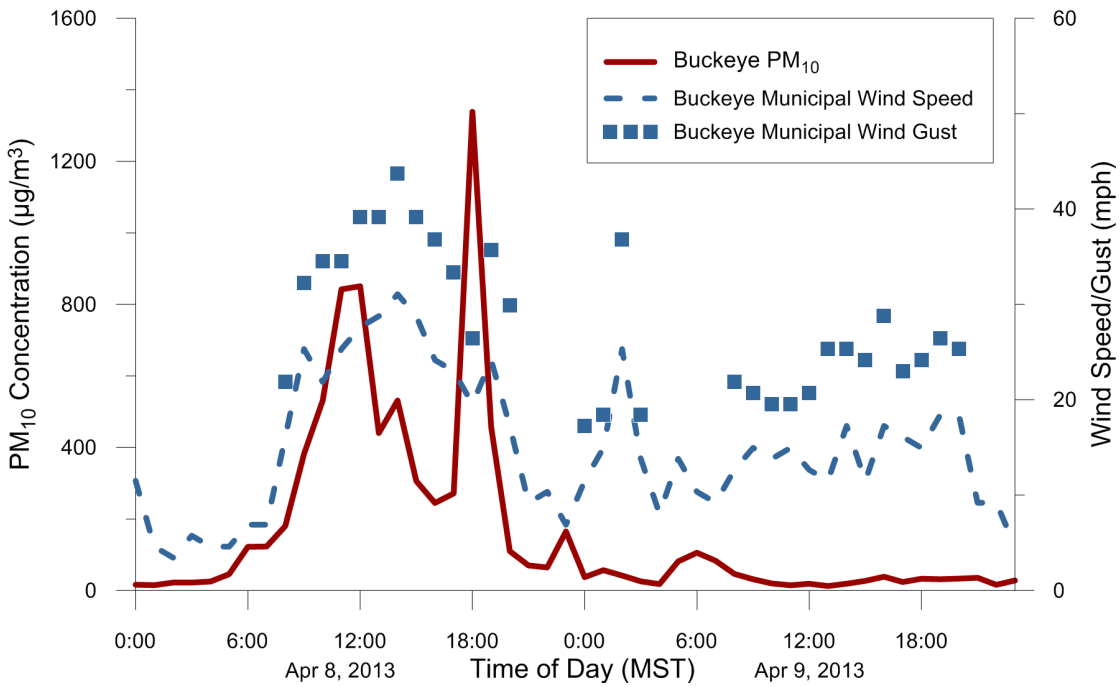

Figure A-2. Hourly PM_{10} concentrations at the Buckeye AQS monitor and wind speeds at Buckeye Municipal Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

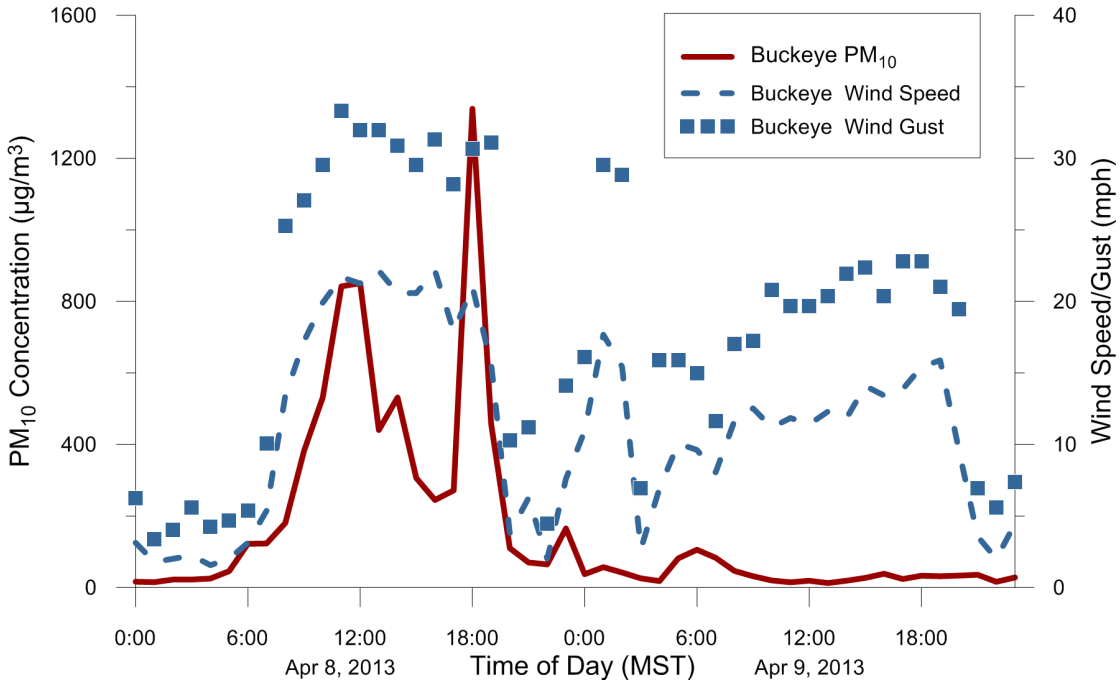

Figure A-3. Hourly PM_{10} concentrations at the Buckeye AQS monitor and wind speeds at the Buckeye AZMET monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

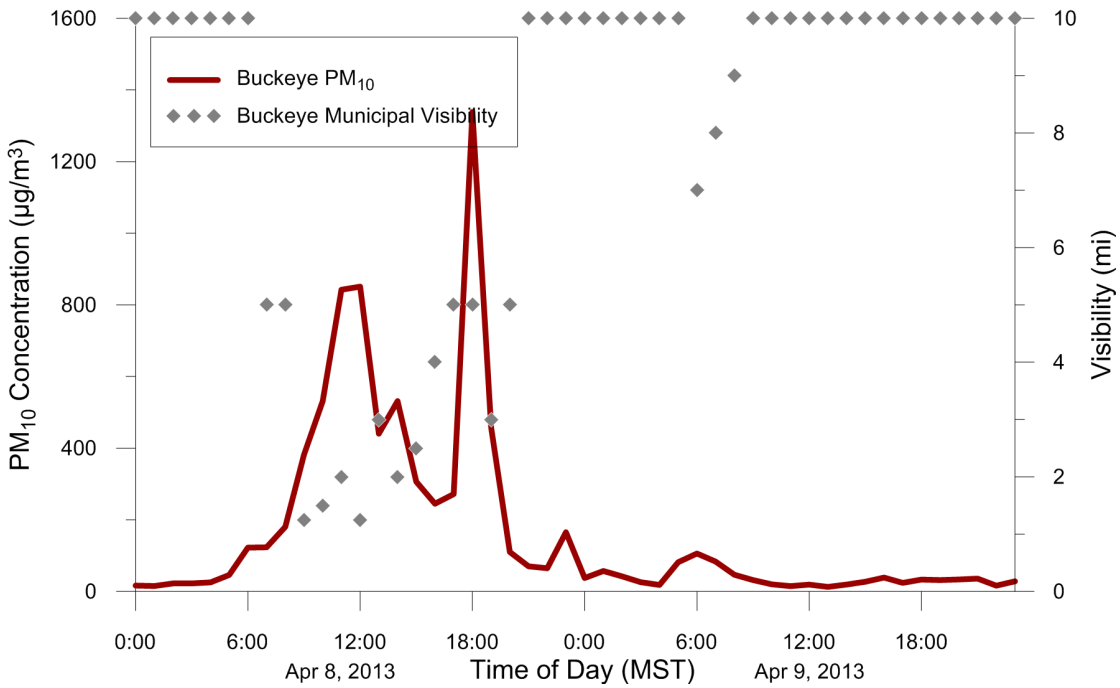

Figure A-4. Hourly PM_{10} concentrations at the Buckeye AQS monitor and visibility at the Buckeye Municipal Airport monitor on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the Buckeye monitor, indicating the presence of windblown dust.

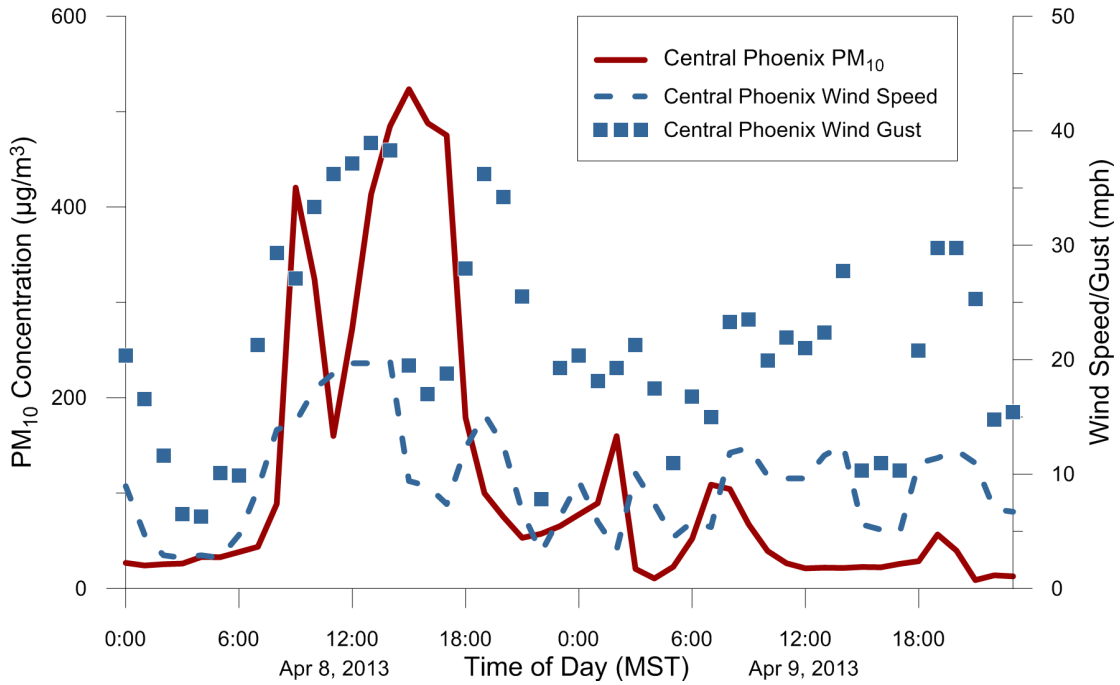

Figure A-5. Hourly PM_{10} concentrations and wind speeds at the Central Phoenix monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 08:00 MST on April 8, indicating the presence of windblown dust.

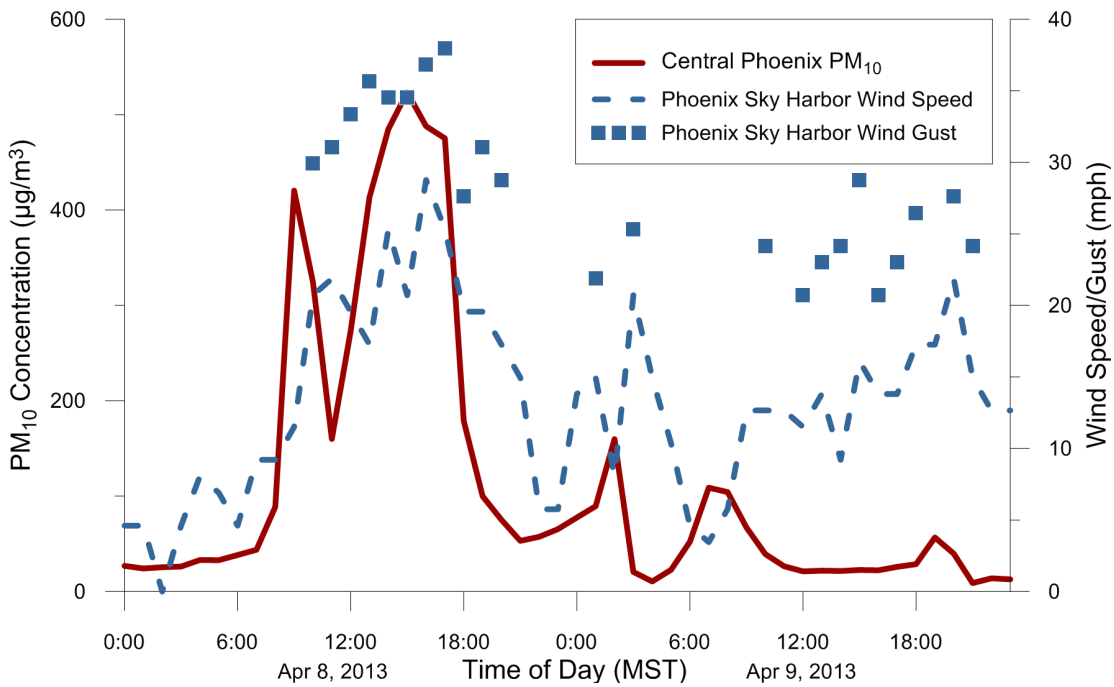

Figure A-6. Hourly PM_{10} concentrations at the Central Phoenix monitor and wind speeds at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

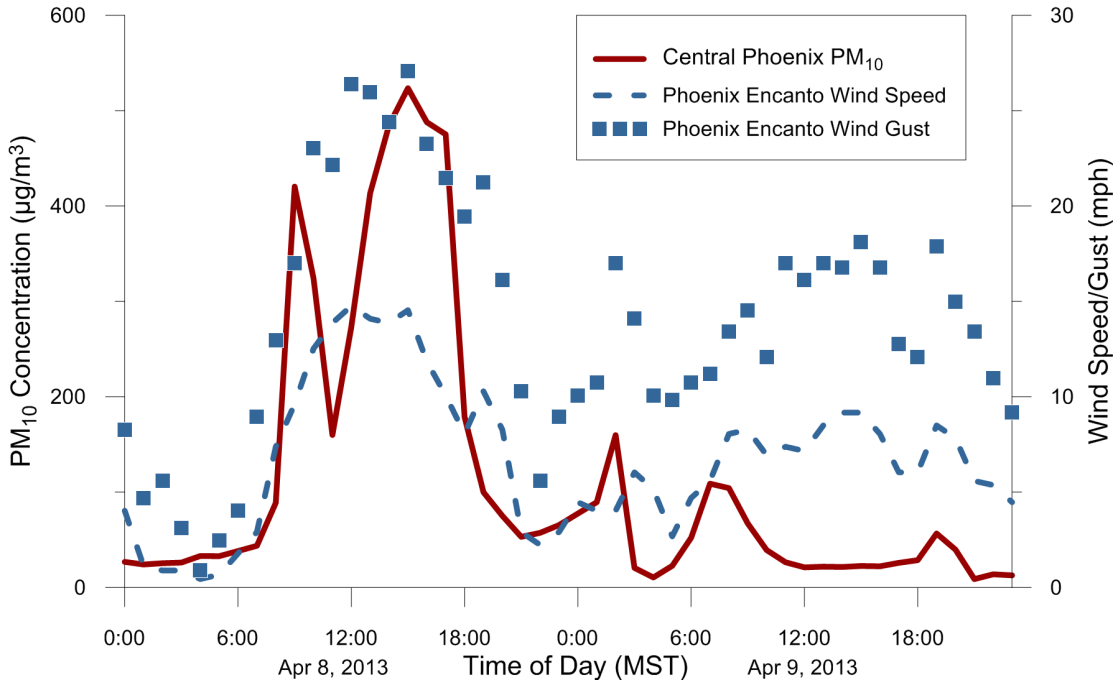

Figure A-7. Hourly PM_{10} concentrations at the Central Phoenix monitor and wind speeds at Phoenix Encanto on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

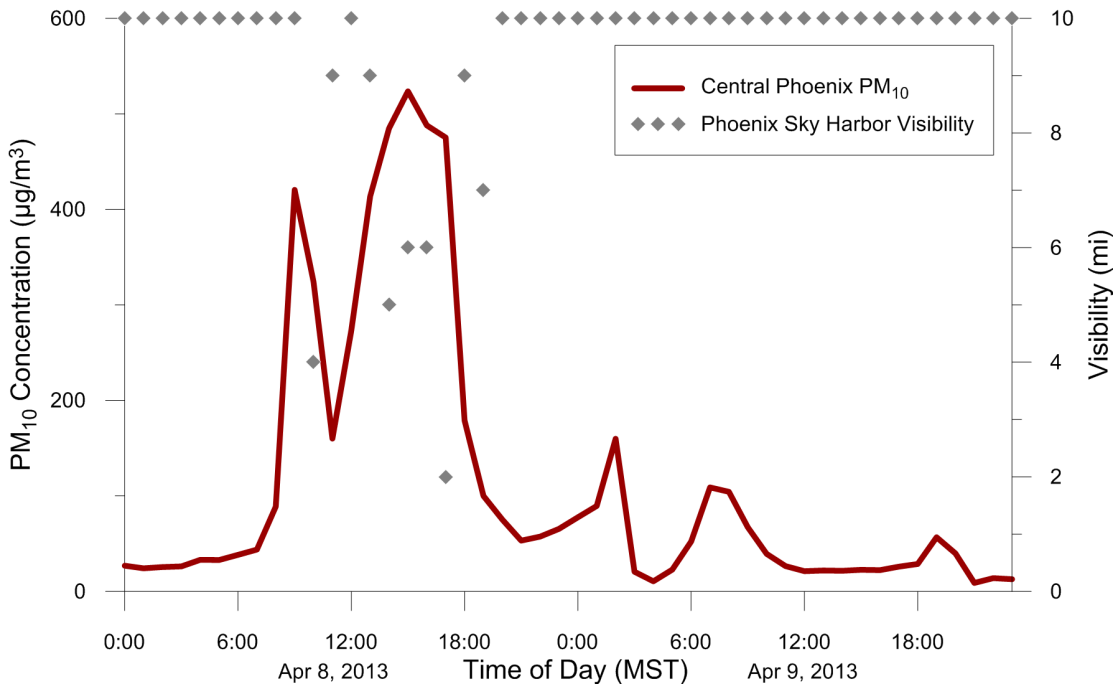

Figure A-8. Hourly PM_{10} concentrations at the Central Phoenix monitor and visibility at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the Central Phoenix monitor, indicating the presence of windblown dust.

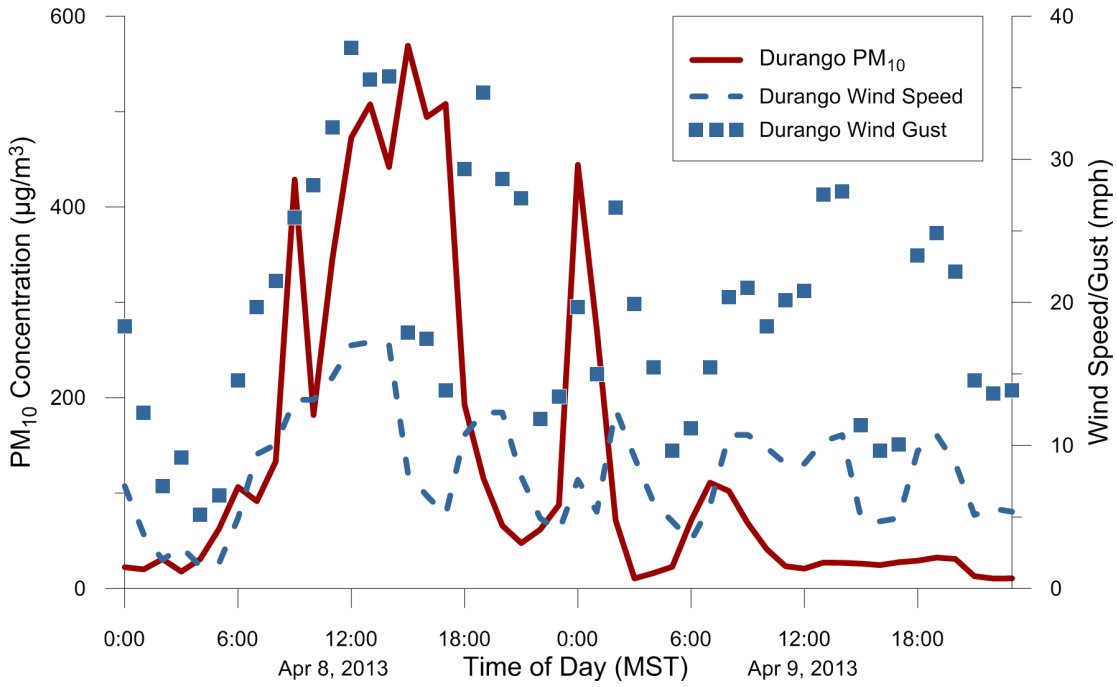

Figure A-9. Hourly PM_{10} concentrations and wind speeds at the Durango Complex monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 08:00 MST on April 8, indicating the presence of windblown dust.

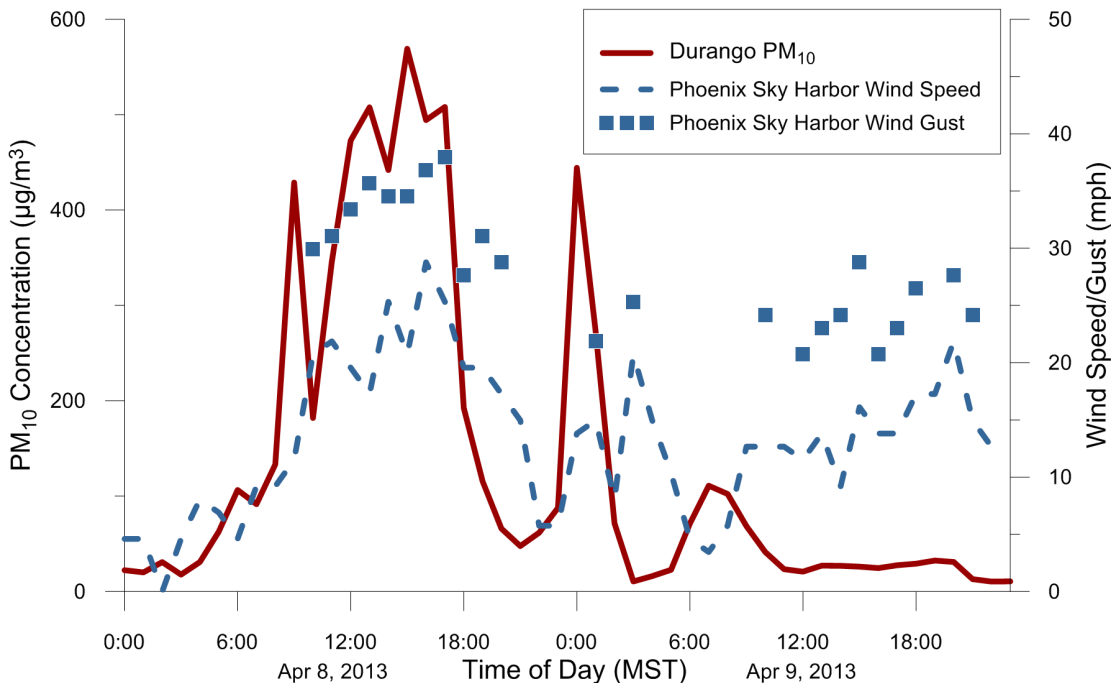

Figure A-10. Hourly PM_{10} concentrations at the Durango Complex monitor and wind speeds at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

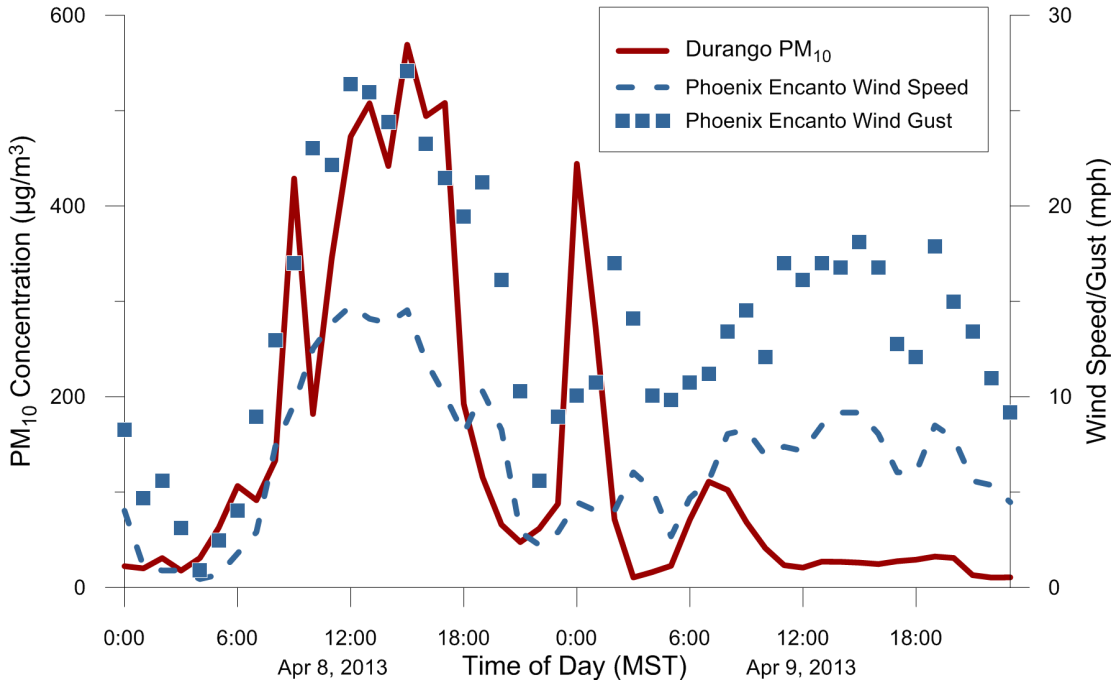

Figure A-11. Hourly PM_{10} concentrations at the Durango Complex monitor and wind speeds at Phoenix Encanto on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

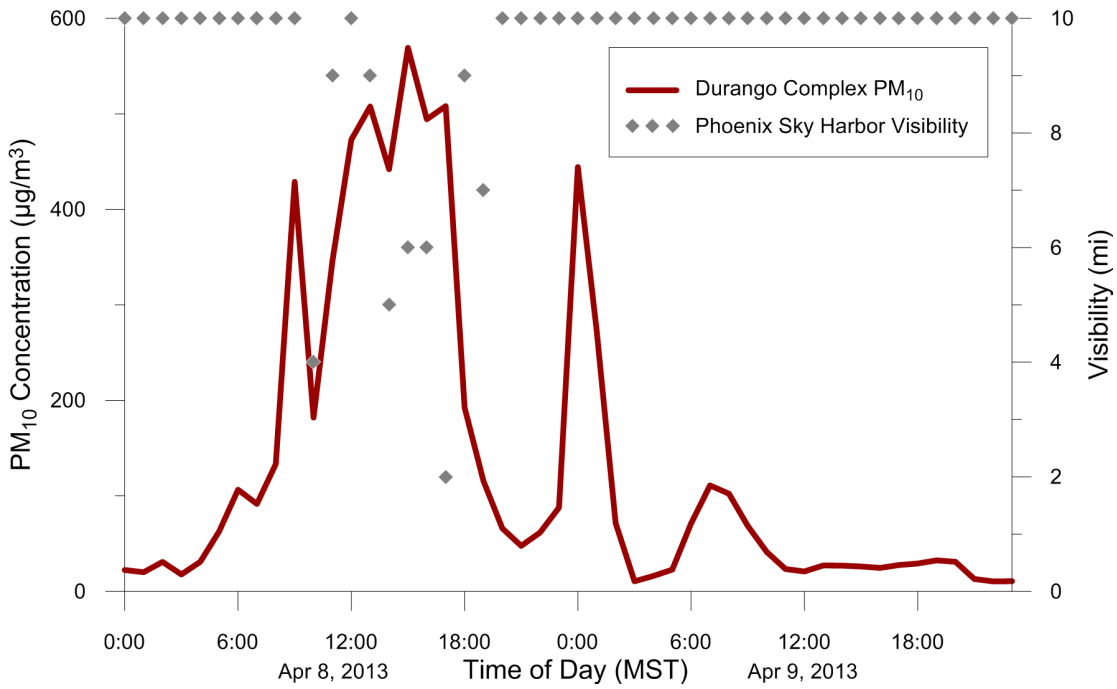

Figure A-12. Hourly PM_{10} concentrations at the Durango Complex monitor and visibility at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the Durango Complex monitor, indicating the presence of windblown dust.

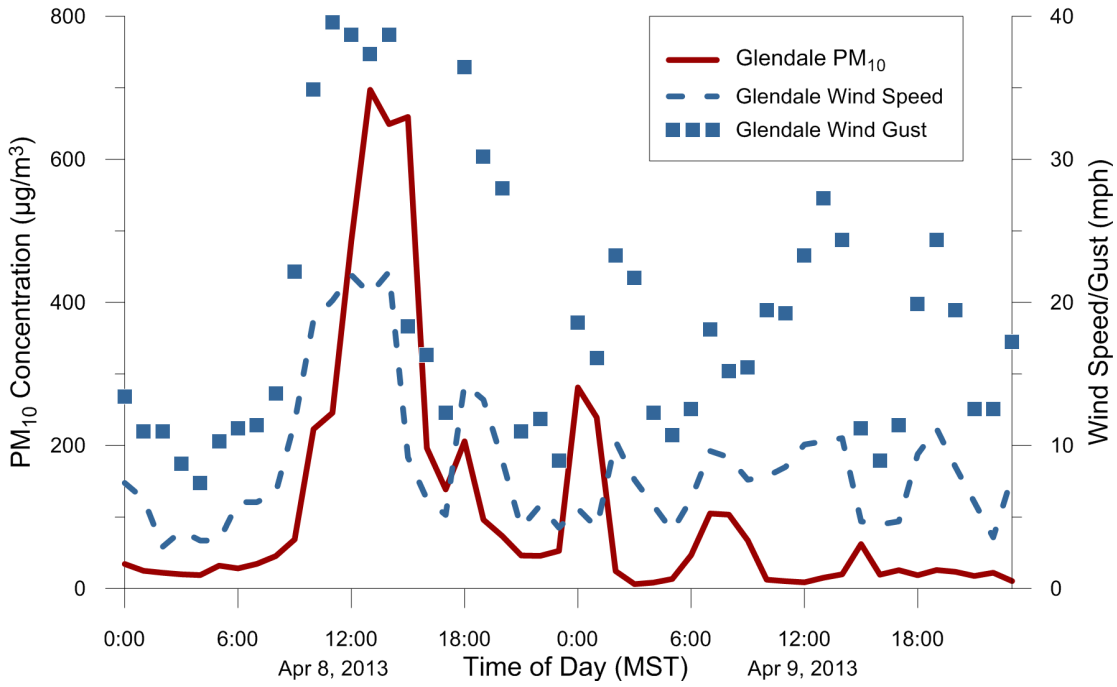

Figure A-13. Hourly PM_{10} concentrations and wind speeds at the Glendale monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 10:00 MST on April 8, indicating the presence of windblown dust.

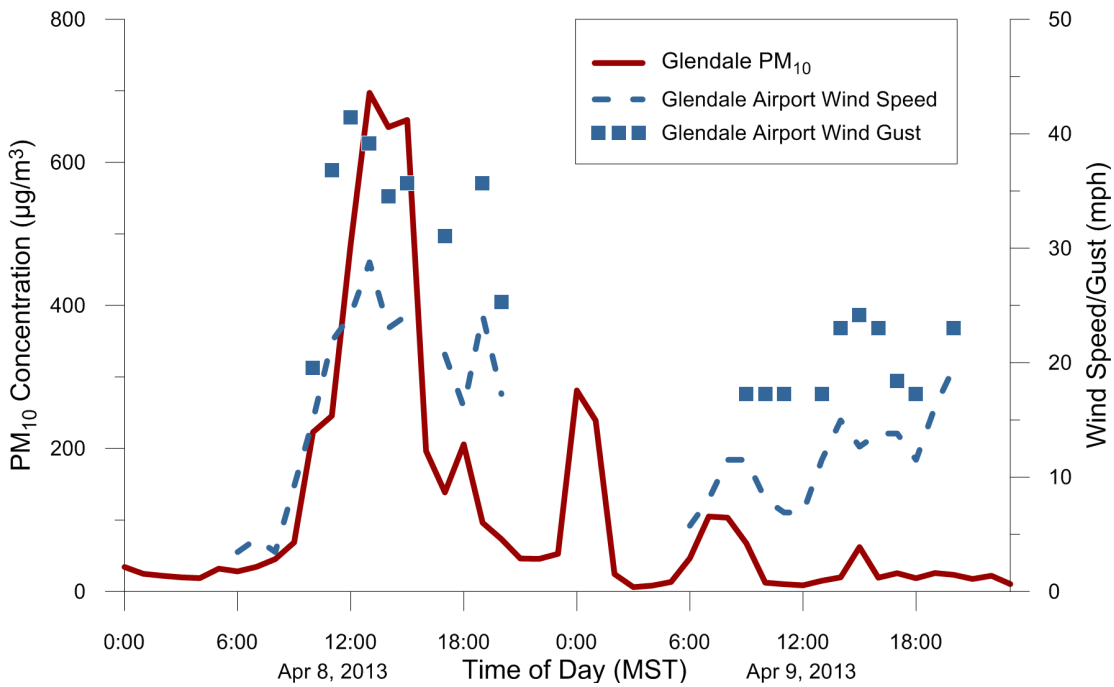

Figure A-14. Hourly PM_{10} concentrations at the Glendale monitor and wind speeds at Glendale Municipal Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 10:00 MST on April 8, indicating the presence of windblown dust.

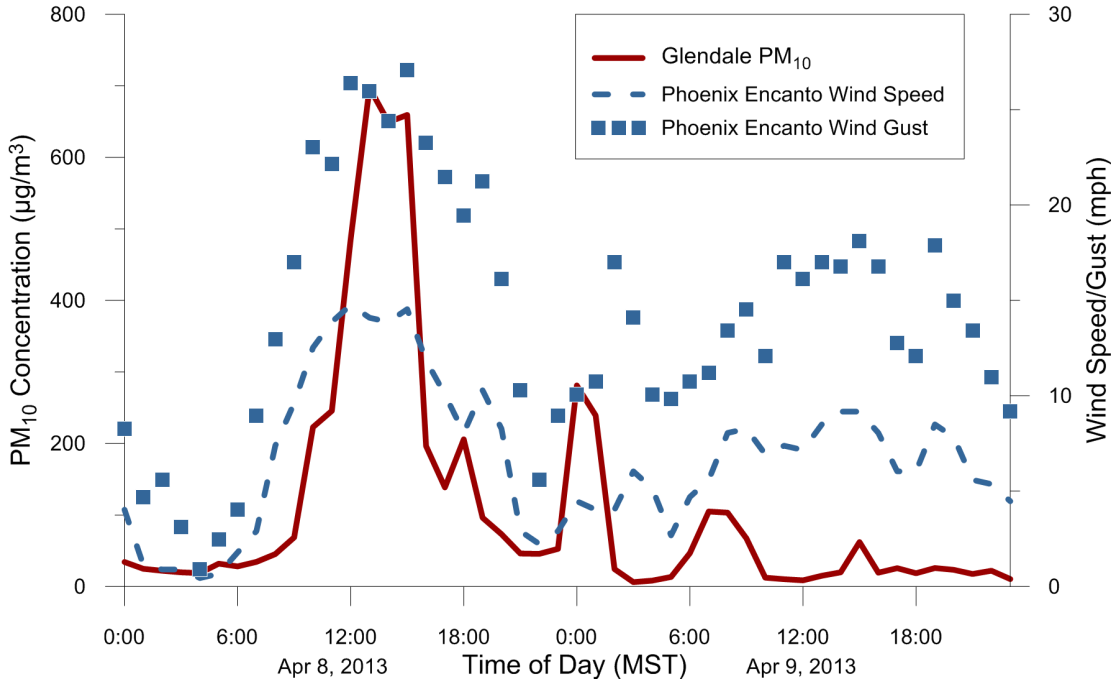

Figure A-15. Hourly PM_{10} concentrations at the Glendale monitor and wind speeds at Phoenix Encanto on April 8 and 9, 2013. Wind speeds sharply increased beginning at 08:00 MST on April 8, followed by a sharp increase in PM_{10} concentrations, indicating the presence of windblown dust.

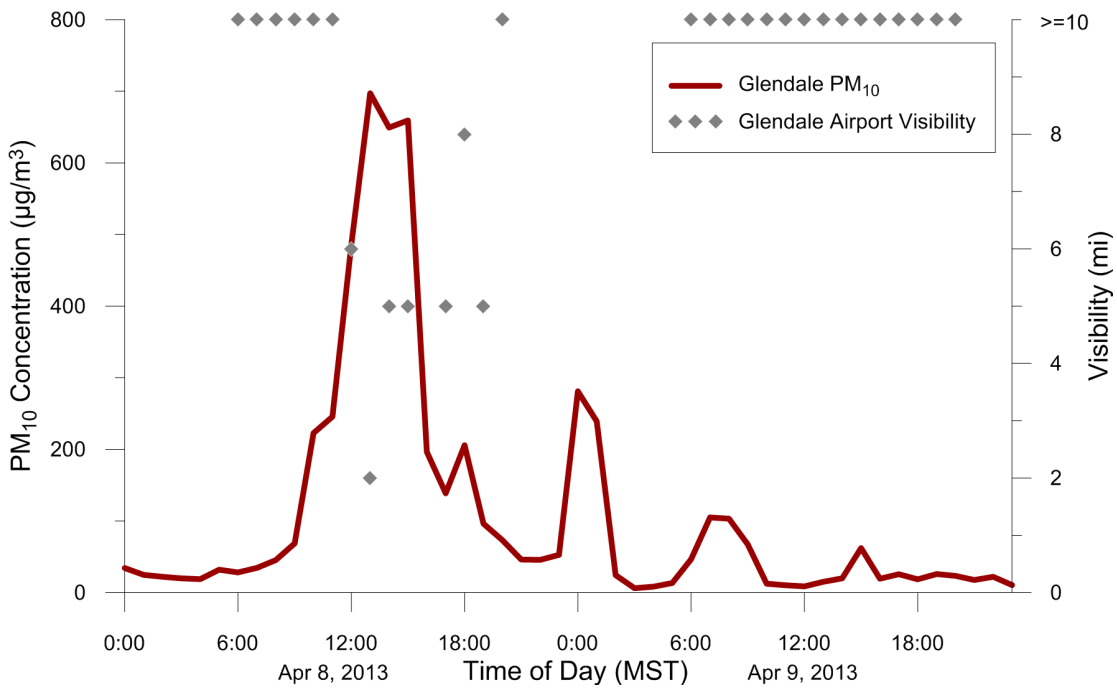

Figure A-16. Hourly PM_{10} concentrations at the Glendale monitor and visibility at Glendale Municipal Airport on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the Glendale monitor, indicating the presence of windblown dust.

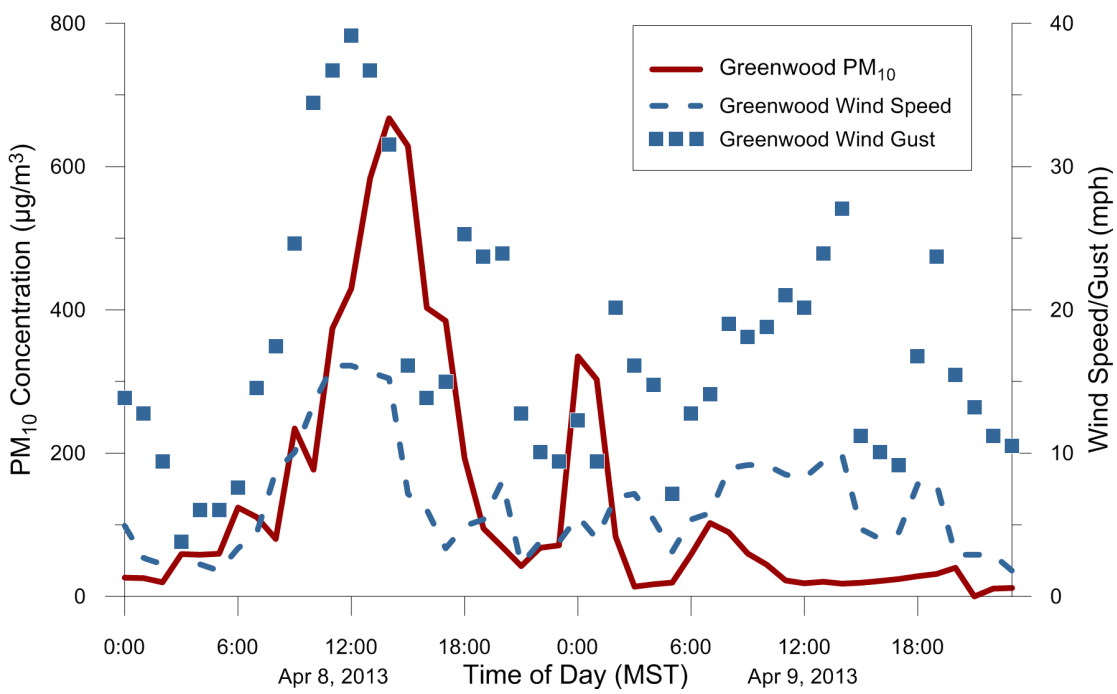

Figure A-17. Hourly PM_{10} concentrations and wind speeds at the Greenwood monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 08:00 MST on April 8, indicating the presence of windblown dust.

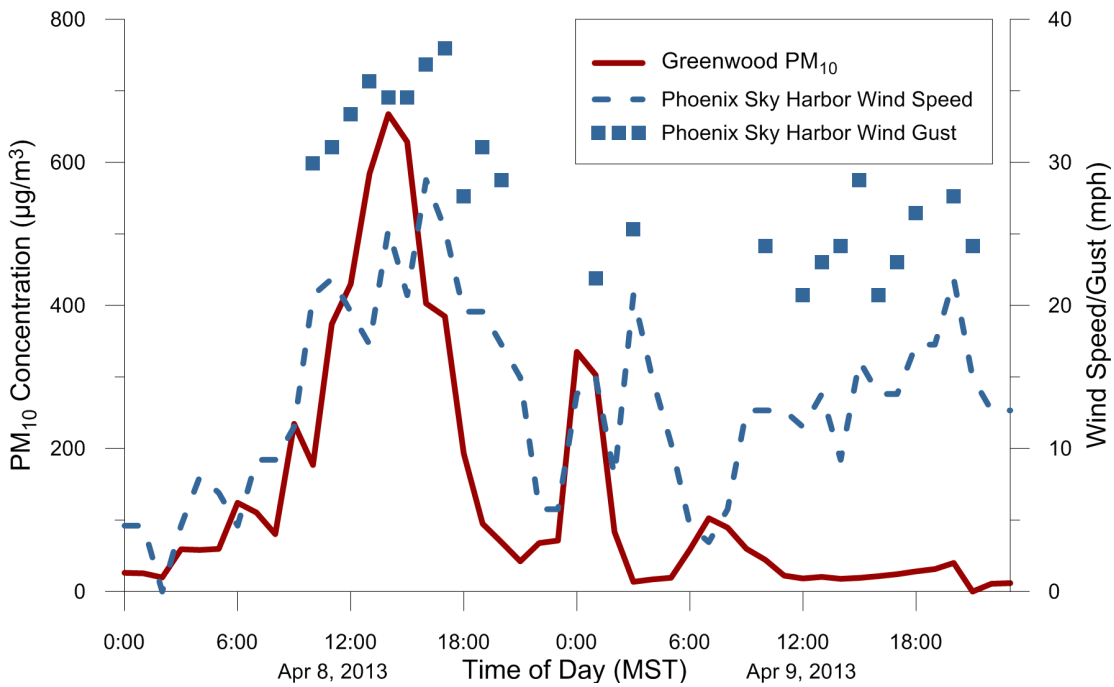

Figure A-18. Hourly PM_{10} concentrations at the Greenwood monitor and wind speeds at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 08:00 MST on April 8, indicating the presence of windblown dust.

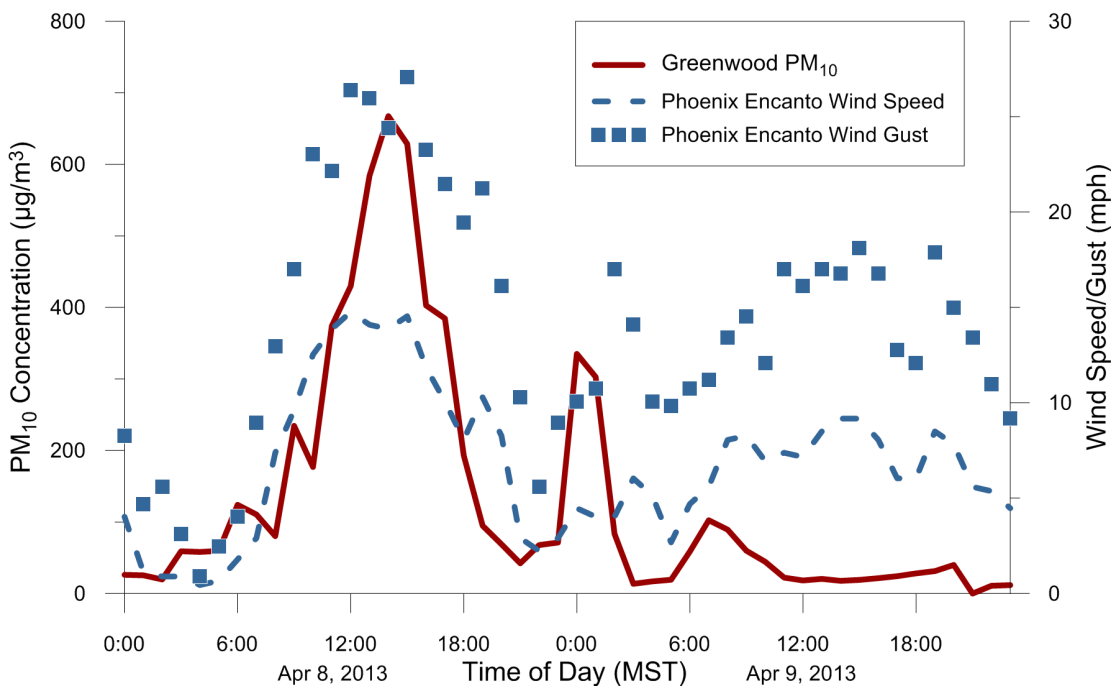

Figure A-19. Hourly PM_{10} concentrations at the Greenwood monitor and wind speeds at Phoenix Encanto on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 08:00 MST on April 8, indicating the presence of windblown dust.

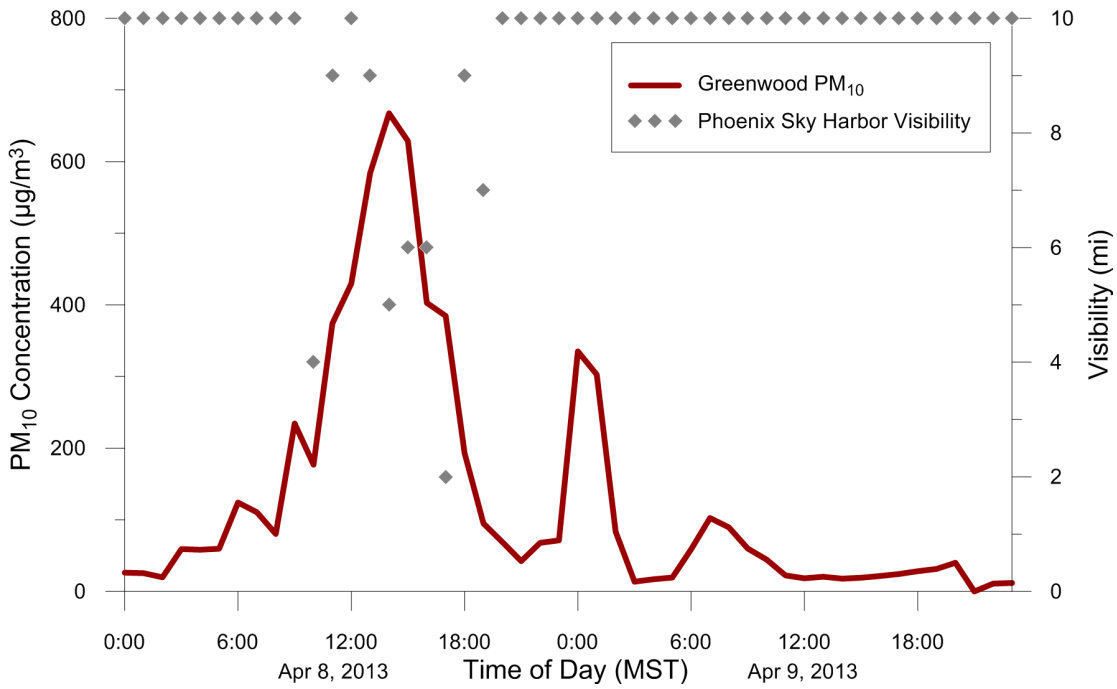

Figure A-20. Hourly PM_{10} concentrations at the Greenwood monitor and visibility at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the Greenwood monitor, indicating the presence of windblown dust.

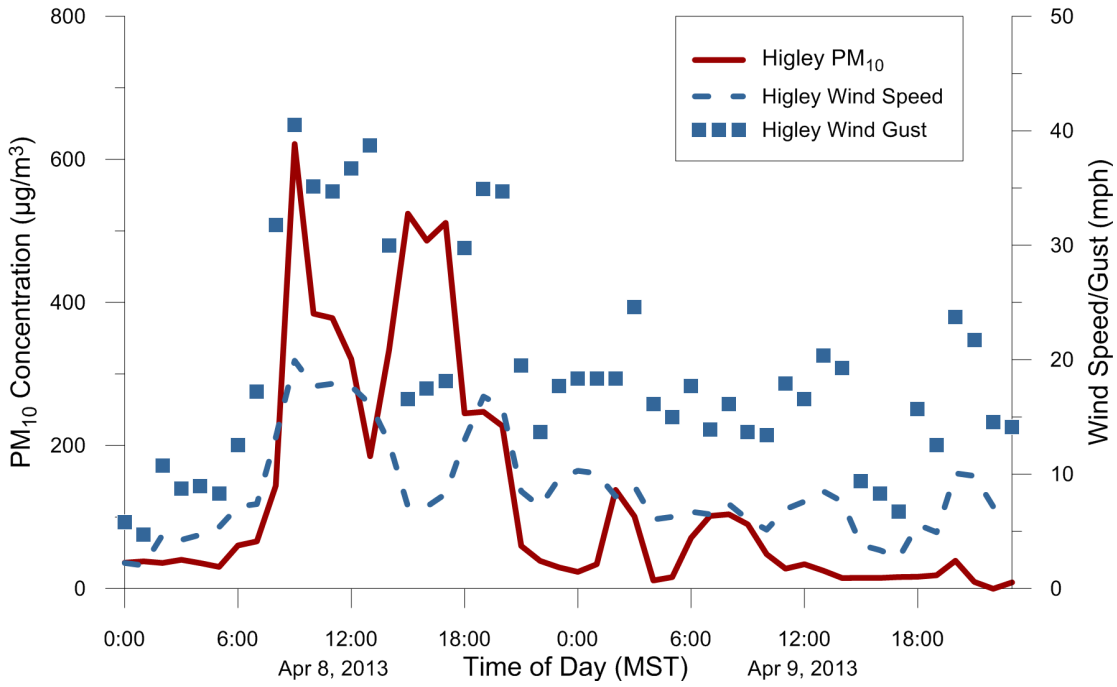

Figure A-21. Hourly PM_{10} concentrations and wind speeds at the Higley monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

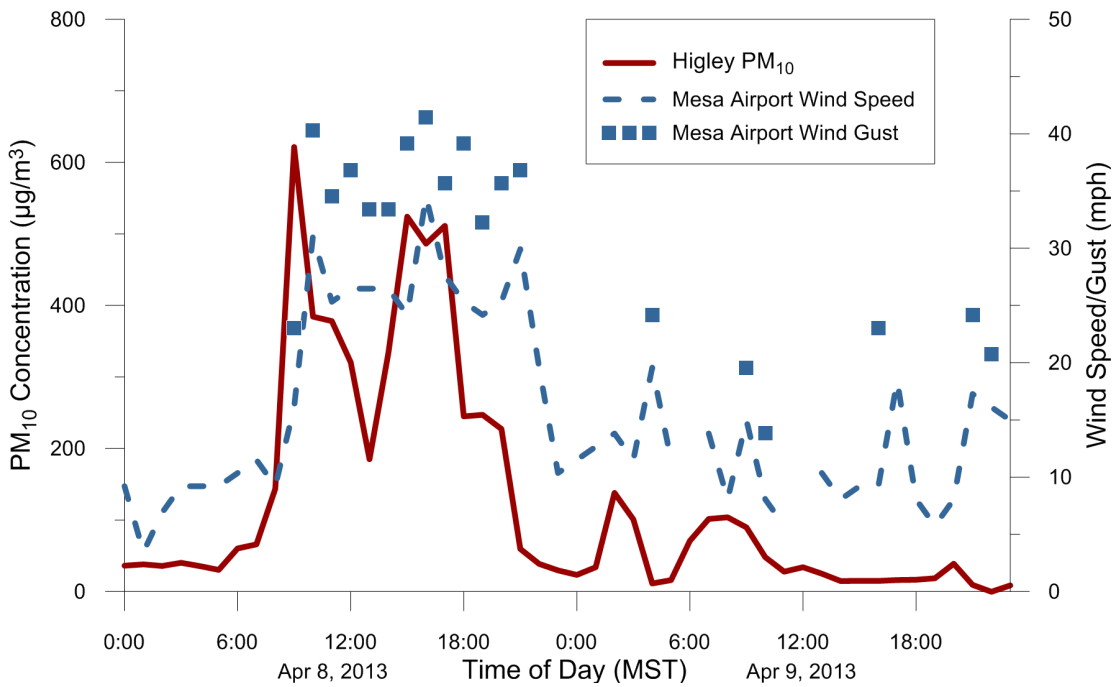

Figure A-22. Hourly PM_{10} concentrations at the Higley monitor and wind speeds at Phoenix-Mesa Gateway Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 8:00 MST on April 8, indicating the presence of windblown dust.

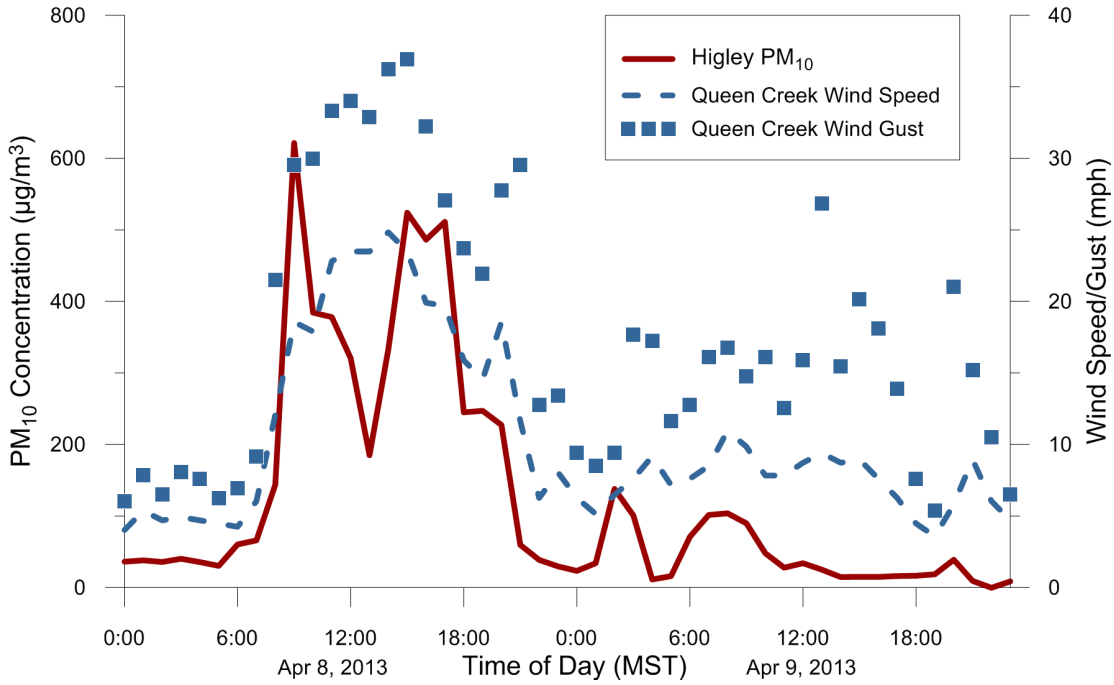

Figure A-23. Hourly PM_{10} concentrations at the Higley monitor and wind speeds at Queen Creek on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

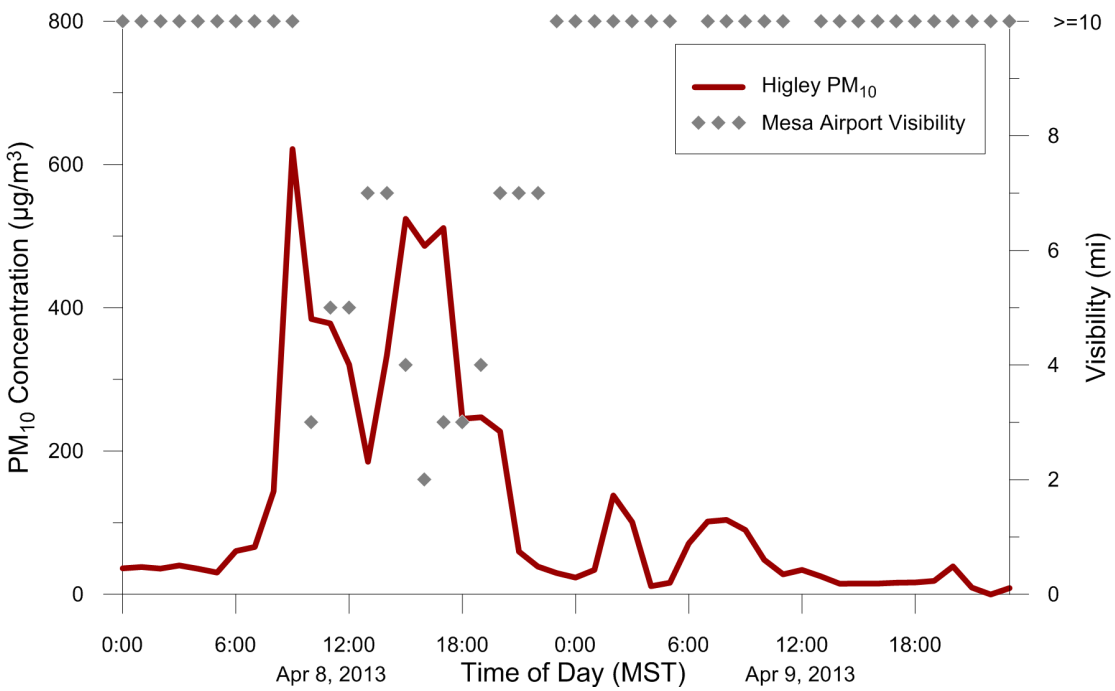

Figure A-24. Hourly PM_{10} concentrations at the Higley monitor and visibility at Phoenix-Mesa Gateway Airport on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the Higley monitor, indicating the presence of windblown dust.

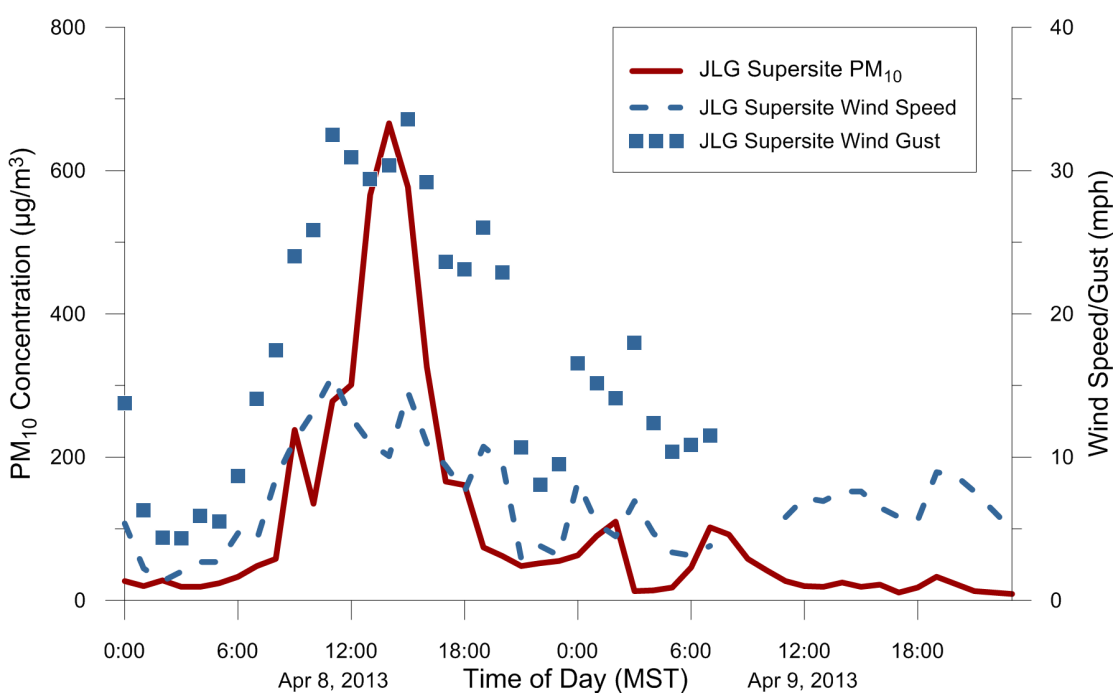

Figure A-25. Hourly PM_{10} concentrations and wind speeds at the JLG Supersite monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 09:00 MST on April 8, indicating the presence of windblown dust.

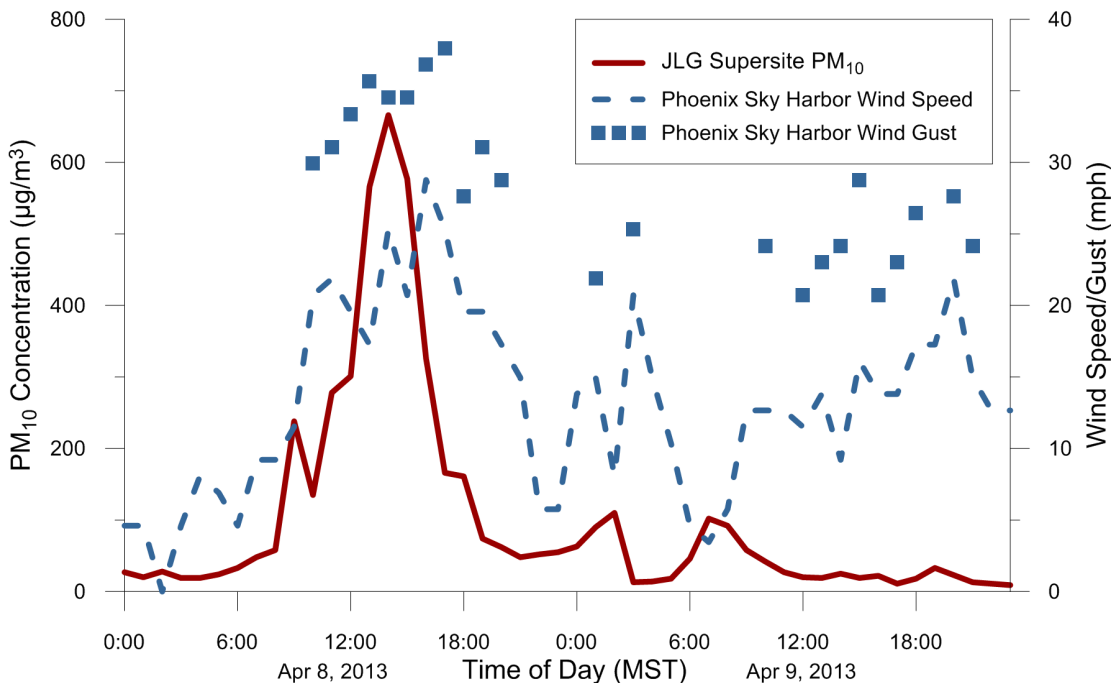

Figure A-26. Hourly PM_{10} concentrations at the JLG Supersite monitor and wind speeds at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 09:00 MST on April 8, indicating the presence of windblown dust.

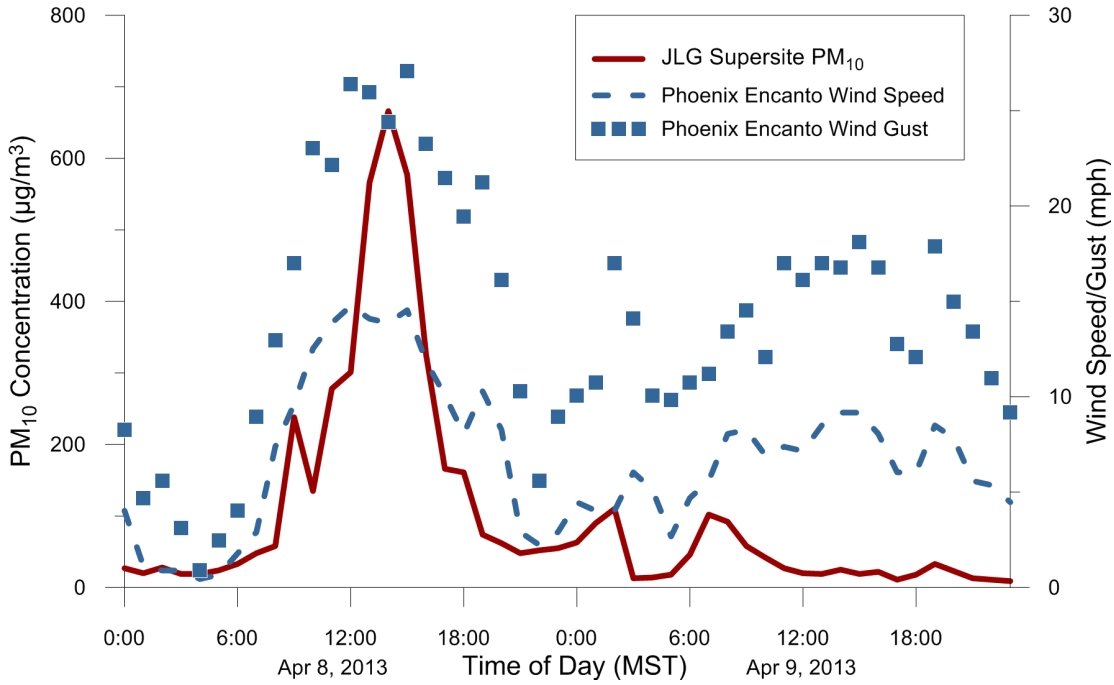

Figure A-27. Hourly PM_{10} concentrations at the JLG Supersite monitor and wind speeds at Phoenix Encanto on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 09:00 MST on April 8, indicating the presence of windblown dust.

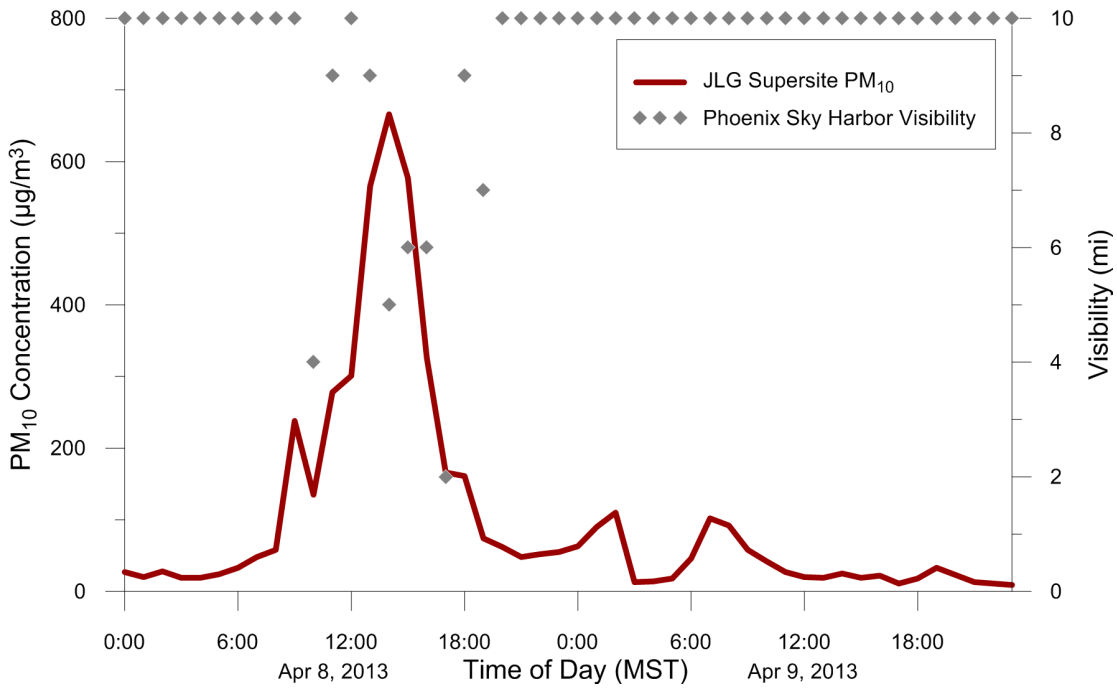

Figure A-28. Hourly PM_{10} concentrations at the JLG Supersite monitor and visibility at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the JLG Supersite monitor, indicating the presence of windblown dust.

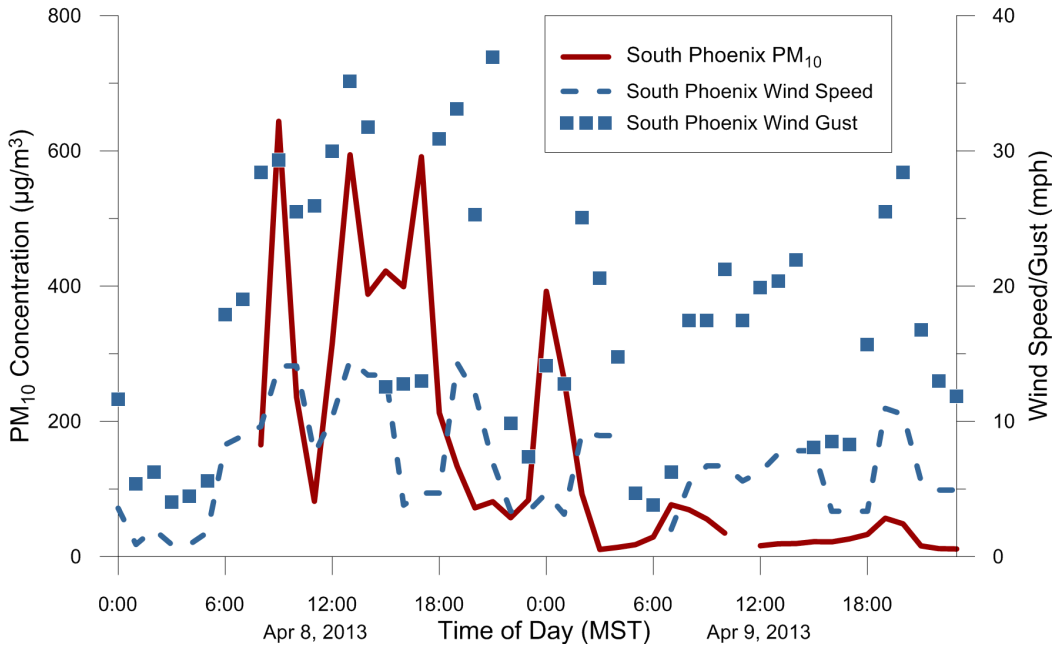

Figure A-29. Hourly PM_{10} concentrations and wind speeds at the South Phoenix monitor on April 8 and 9, 2013. Hourly PM_{10} data were not available at the South Phoenix monitor between 00:00 and 07:00 MST on April 8, 2013, and at 11:00 MST on April 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

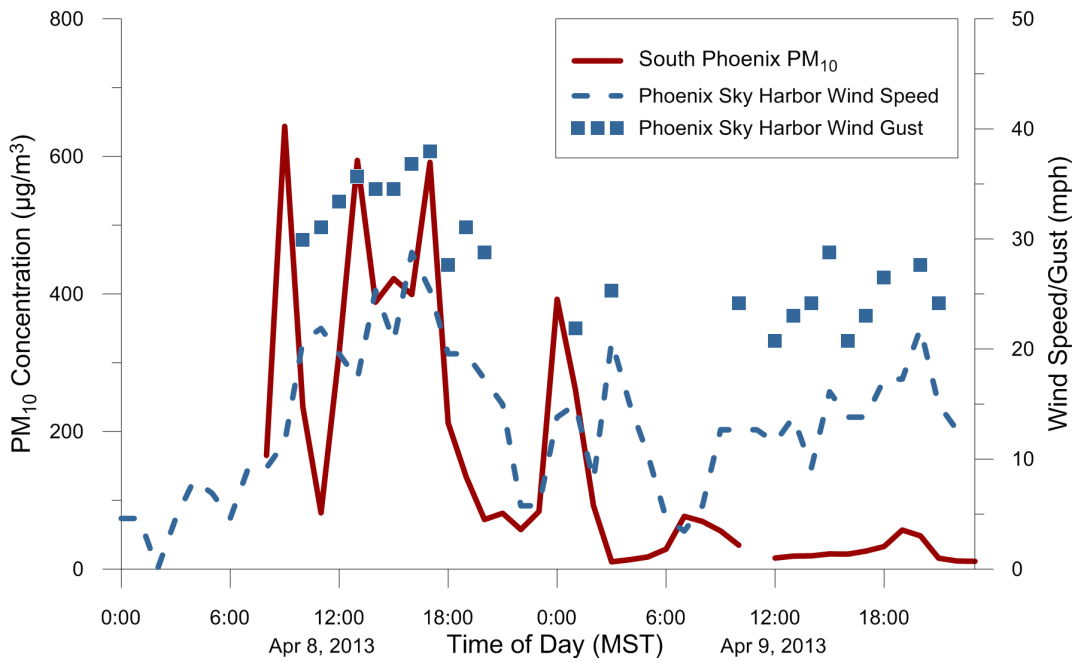

Figure A-30. Hourly PM_{10} concentrations at the South Phoenix monitor and wind speeds at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. Hourly PM_{10} data were not available at the South Phoenix monitor between 00:00 and 07:00 MST on April 8, 2013, and at 11:00 MST on April 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

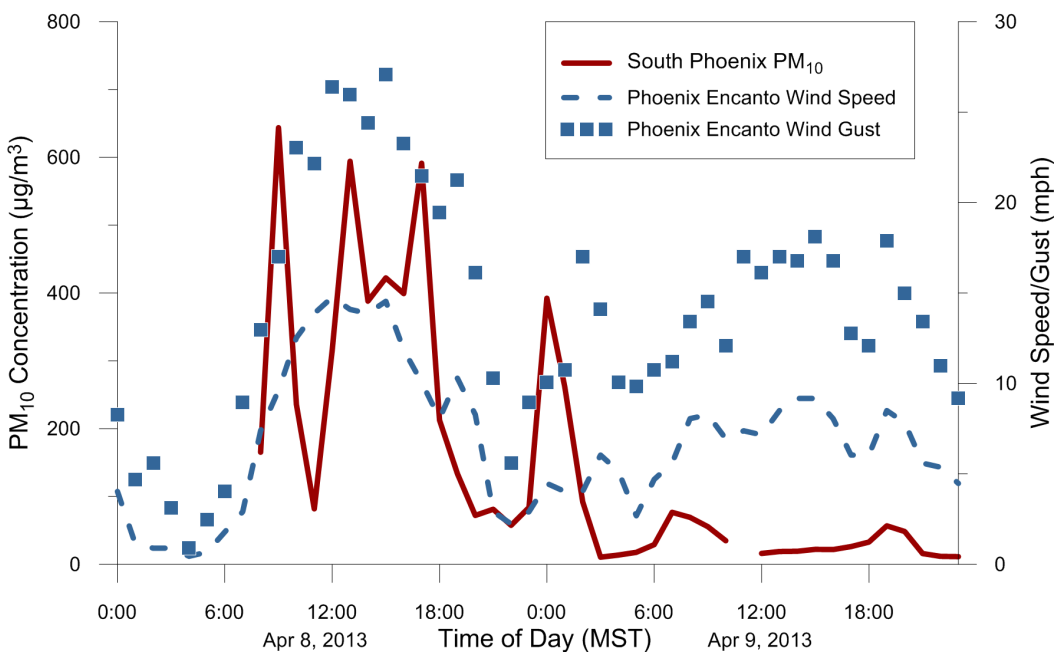

Figure A-31. Hourly PM_{10} concentrations at the South Phoenix monitor and wind speeds at Phoenix Encanto on April 8 and 9, 2013. Hourly PM_{10} data were not available at the South Phoenix monitor between 00:00 and 07:00 MST on April 8, 2013, and at 11:00 MST on April 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

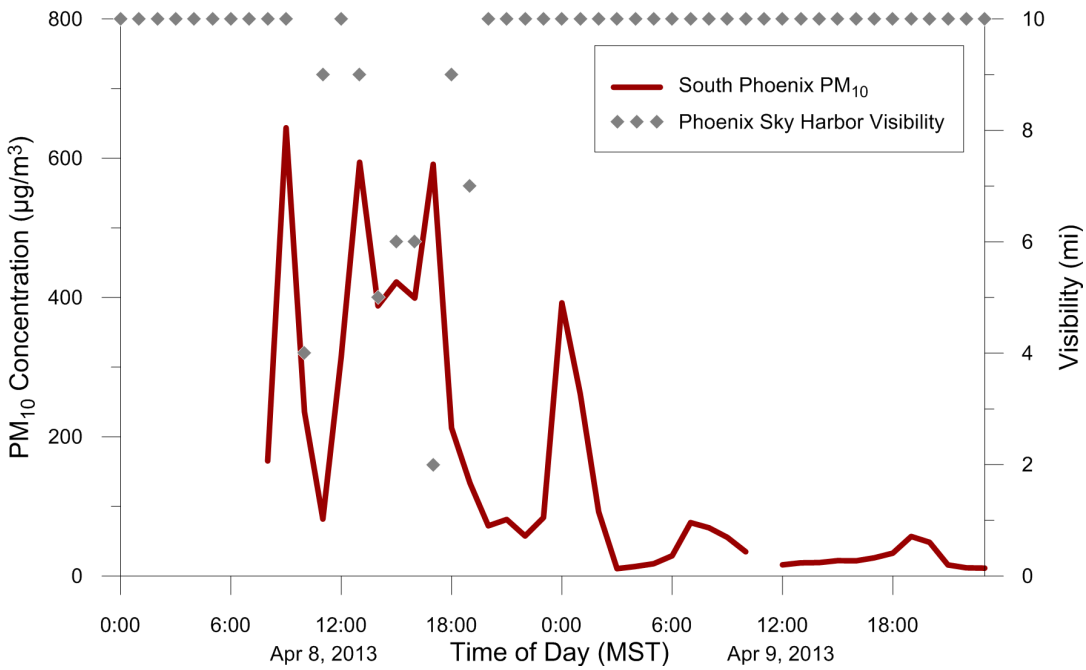

Figure A-32. Hourly PM_{10} concentrations at the South Phoenix monitor and visibility at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. Hourly PM_{10} data were not available at the South Phoenix monitor between 00:00 and 07:00 MST on April 8, 2013, and at 11:00 MST on April 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the South Phoenix monitor, indicating the presence of windblown dust.

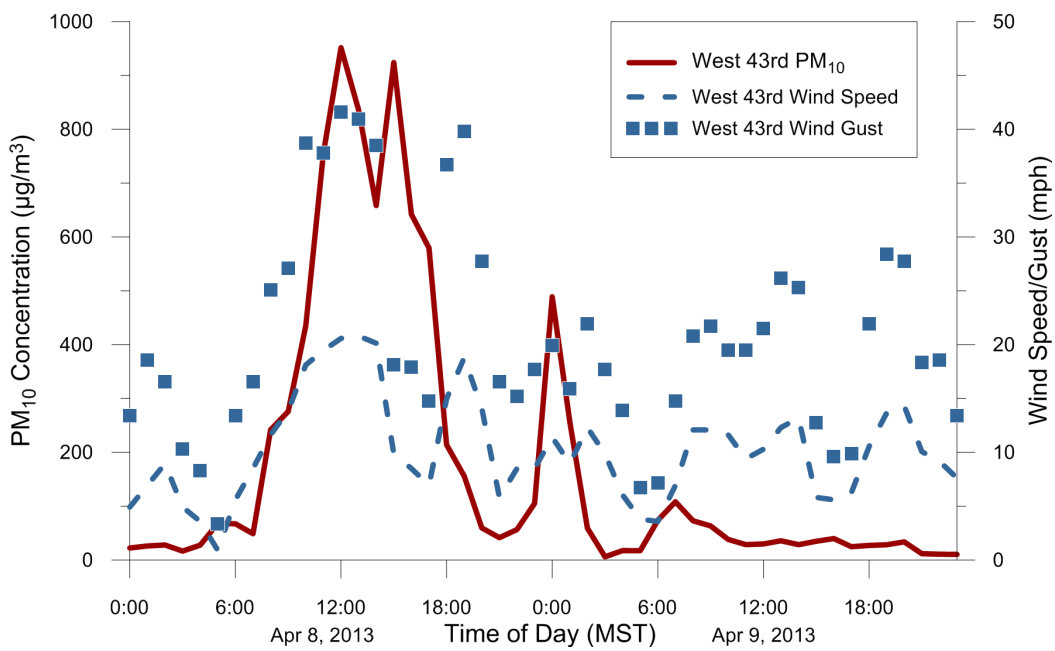

Figure A-33. Hourly PM_{10} concentrations and wind speeds at the West 43rd Avenue monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

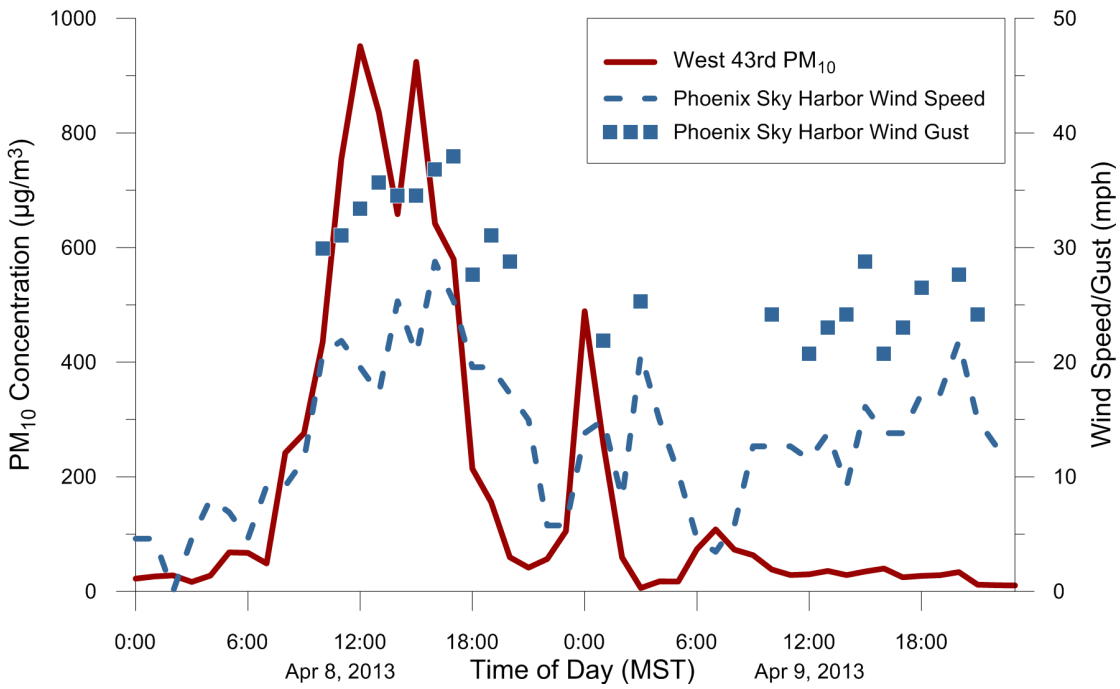

Figure A-34. Hourly PM_{10} concentrations at the West 43rd Avenue monitor and wind speeds at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

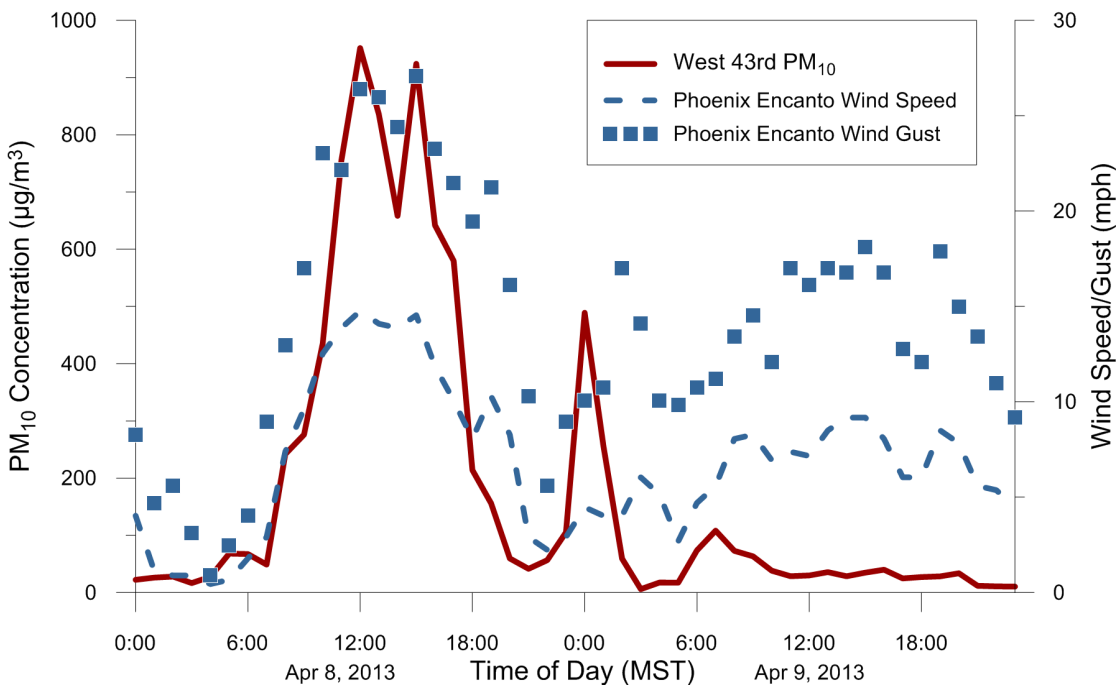

Figure A-35. Hourly PM_{10} concentrations at the West 43rd Avenue monitor and wind speeds at Phoenix Encanto on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

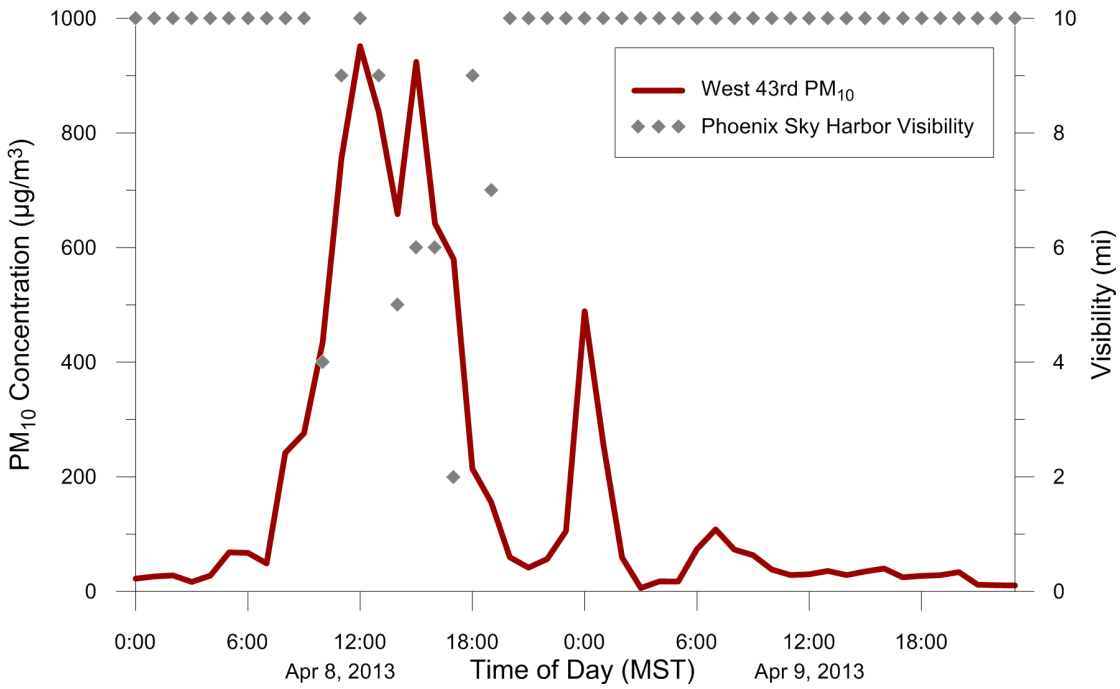

Figure A-36. Hourly PM_{10} concentrations at the West 43rd Avenue monitor and visibility at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the West 43rd Avenue monitor, indicating the presence of windblown dust.

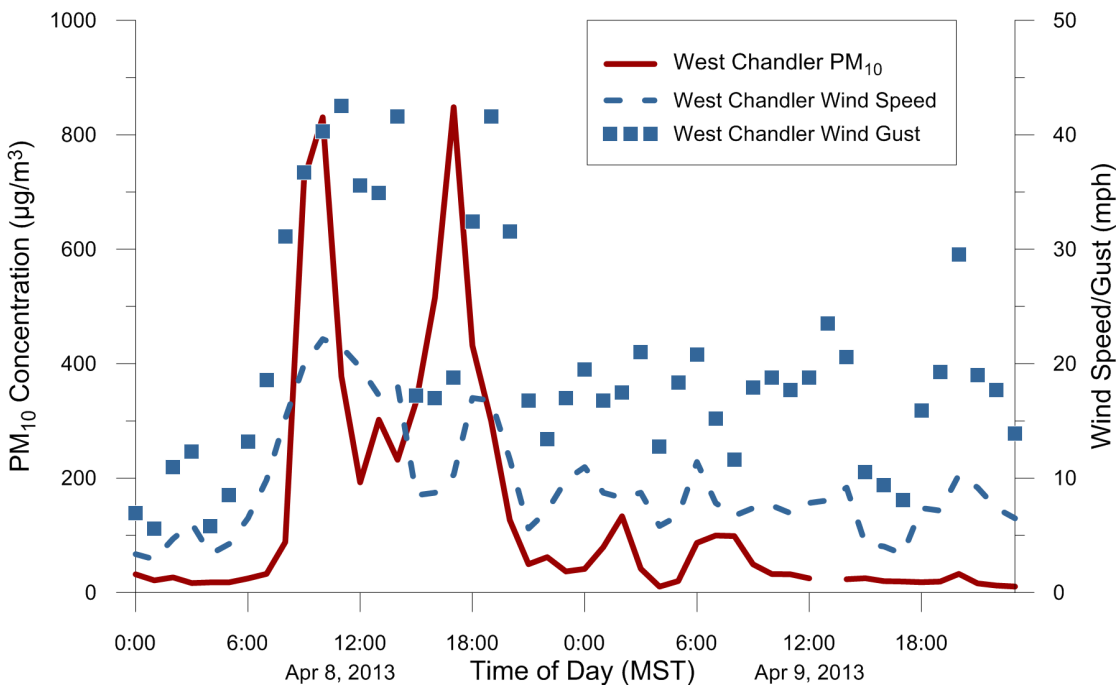

Figure A-37. Hourly PM_{10} concentrations and wind speeds at the West Chandler monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 09:00 MST on April 8, indicating the presence of windblown dust.

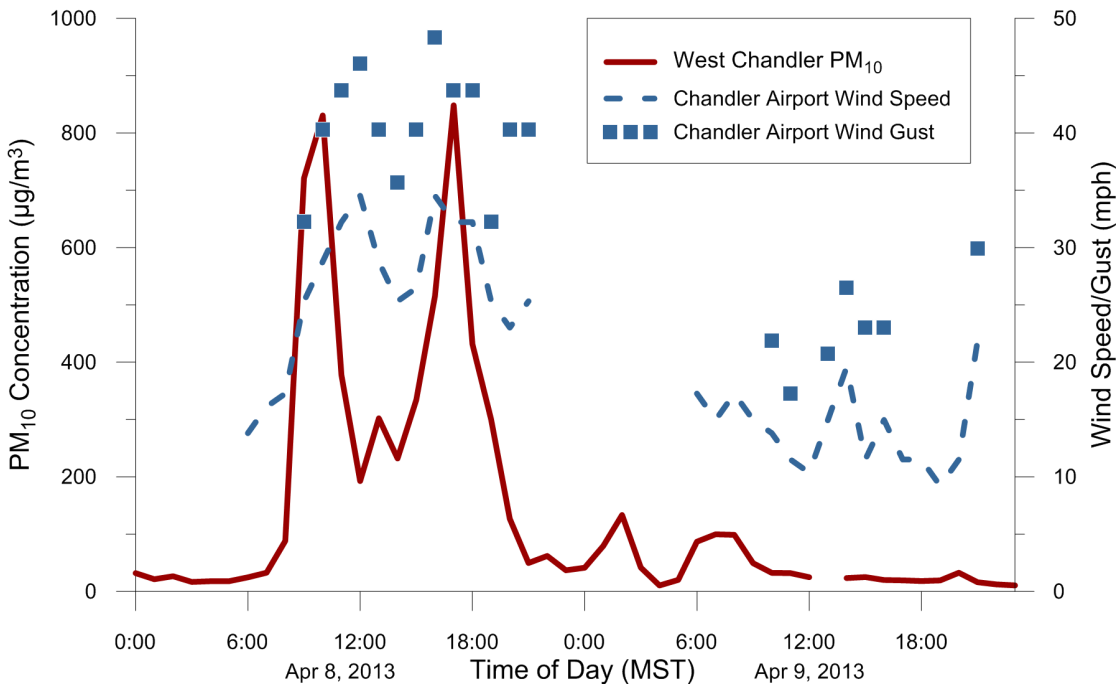

Figure A-38. Hourly PM_{10} concentrations at the West Chandler monitor and wind speeds at Chandler Municipal Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 09:00 MST on April 8, indicating the presence of windblown dust.

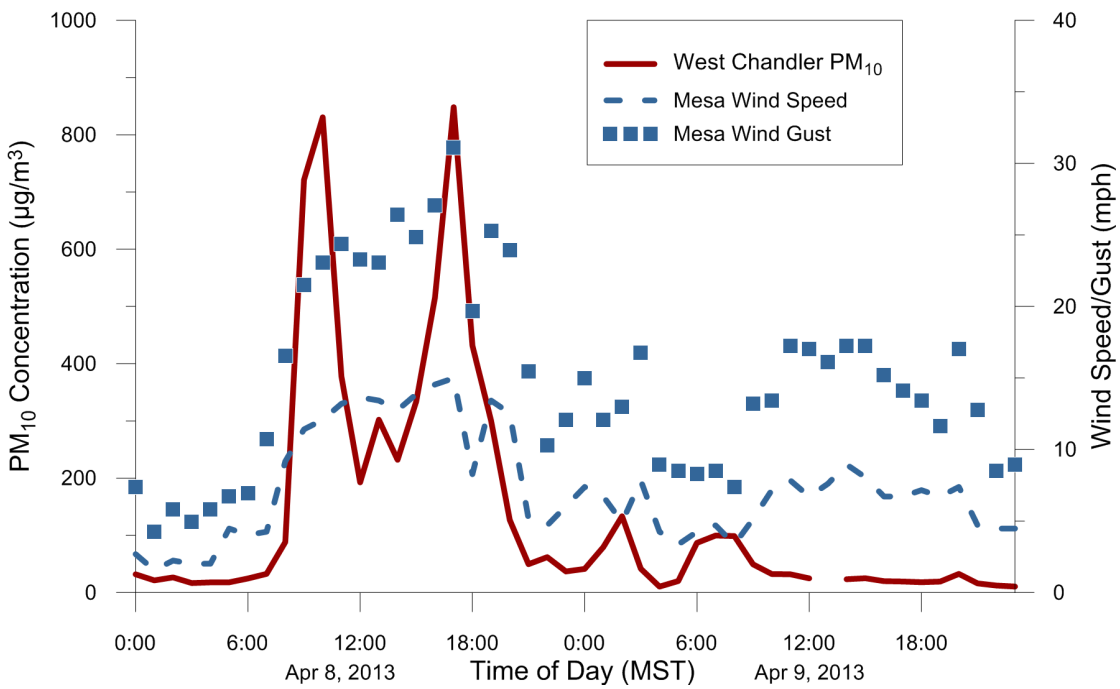

Figure A-39. Hourly PM_{10} concentrations at the West Chandler monitor and wind speeds at Mesa on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 09:00 MST on April 8, indicating the presence of windblown dust.

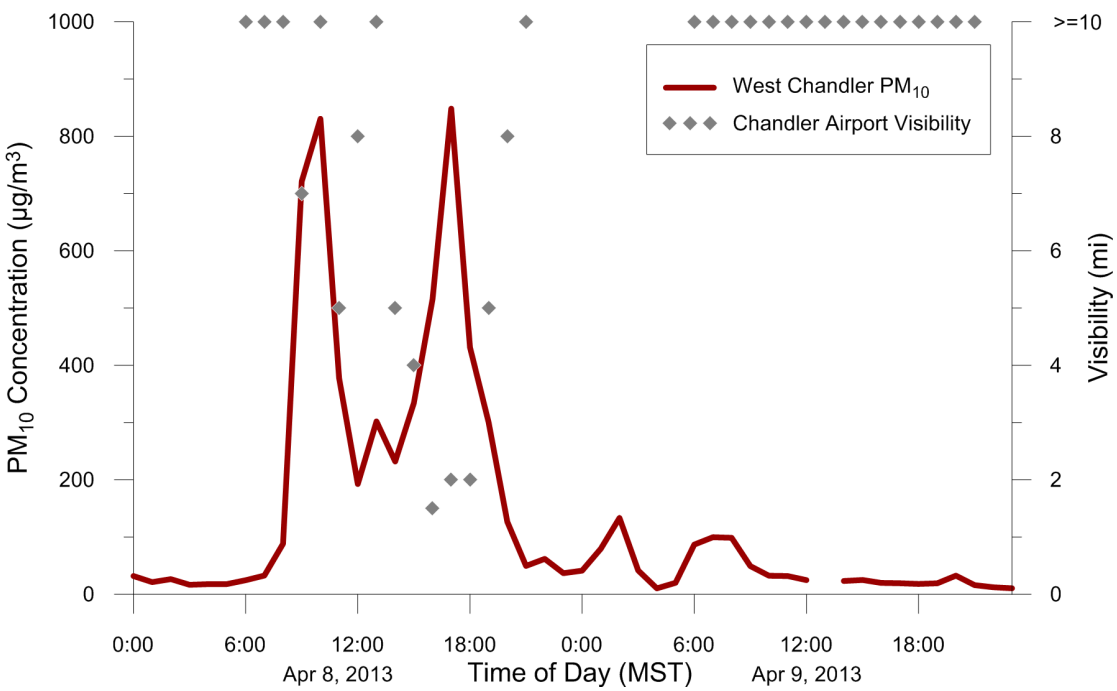

Figure A-40. Hourly PM_{10} concentrations at the West Chandler monitor and visibility at Chandler Municipal Airport on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the West Chandler monitor, indicating the presence of windblown dust.

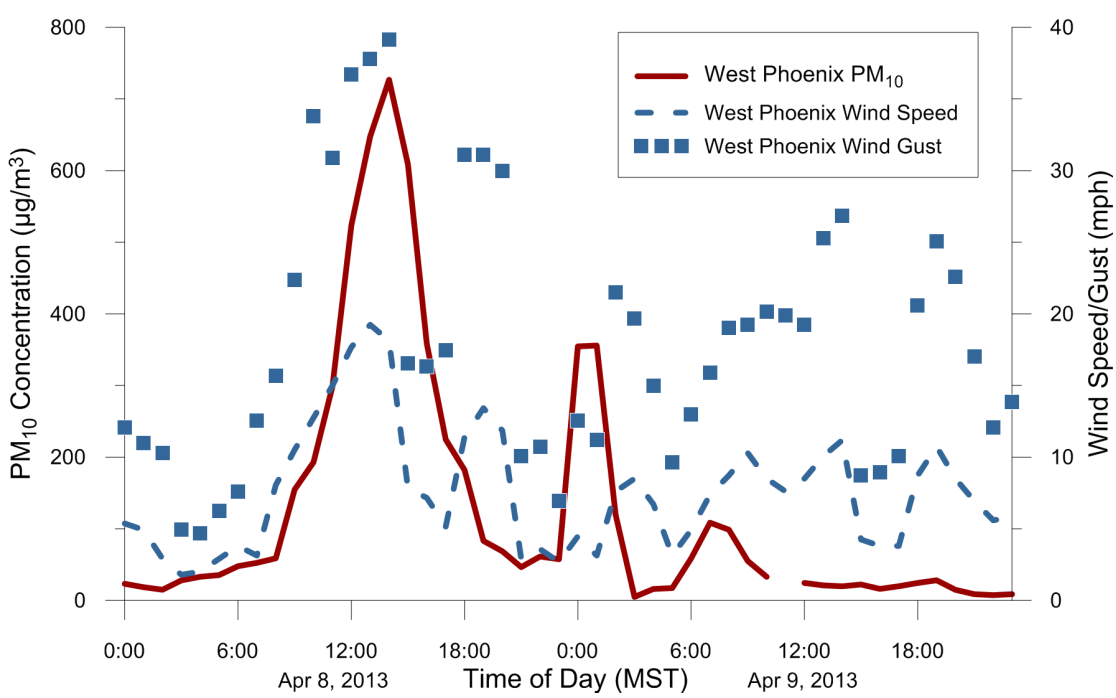

Figure A-41. Hourly PM_{10} concentrations and wind speeds at the West Phoenix monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 09:00 MST on April 8, indicating the presence of windblown dust.

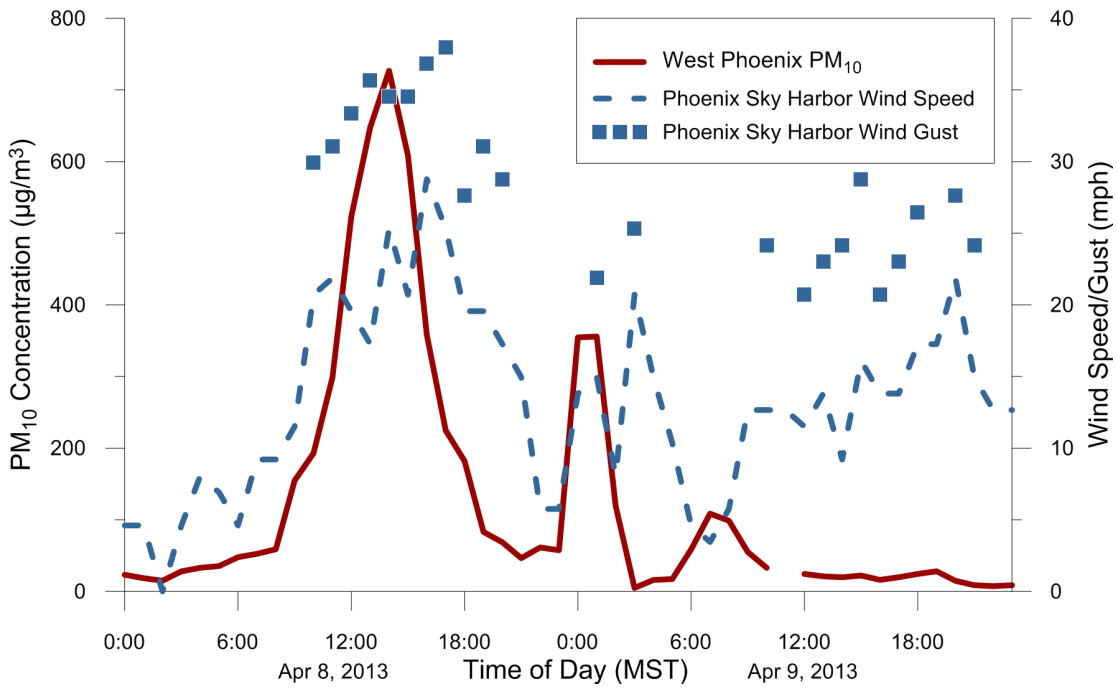

Figure A-42. Hourly PM_{10} concentrations at the West Phoenix monitor and wind speeds at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 09:00 MST on April 8, indicating the presence of windblown dust.

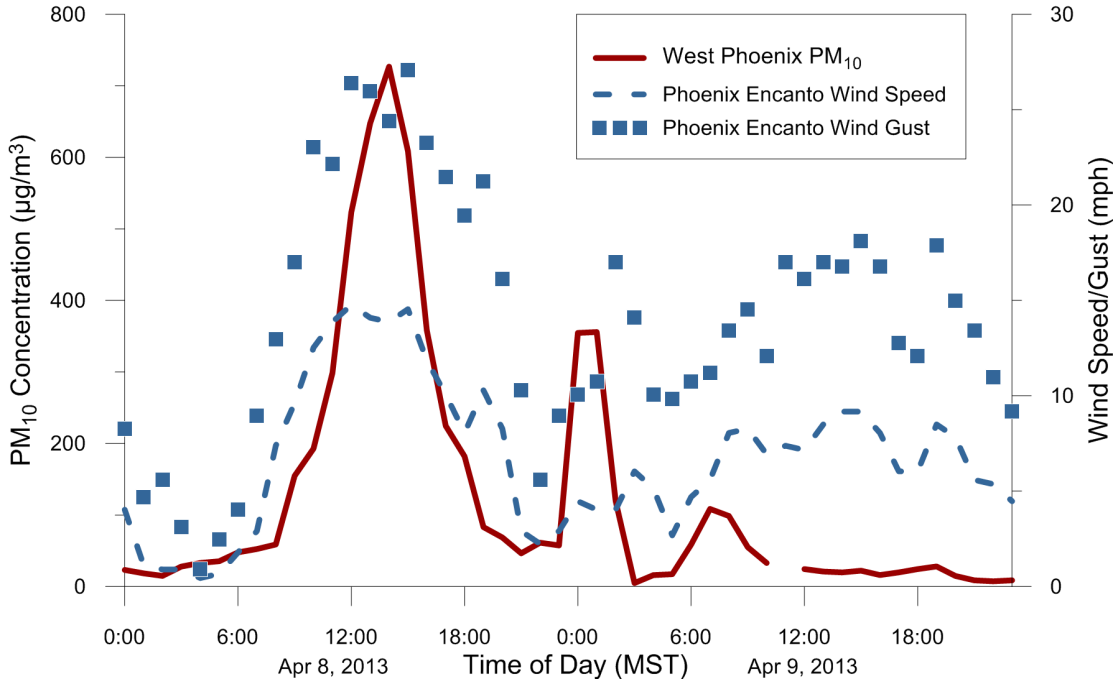

Figure A-43. Hourly PM_{10} concentrations at the West Phoenix monitor and wind speeds at Phoenix Encanto on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

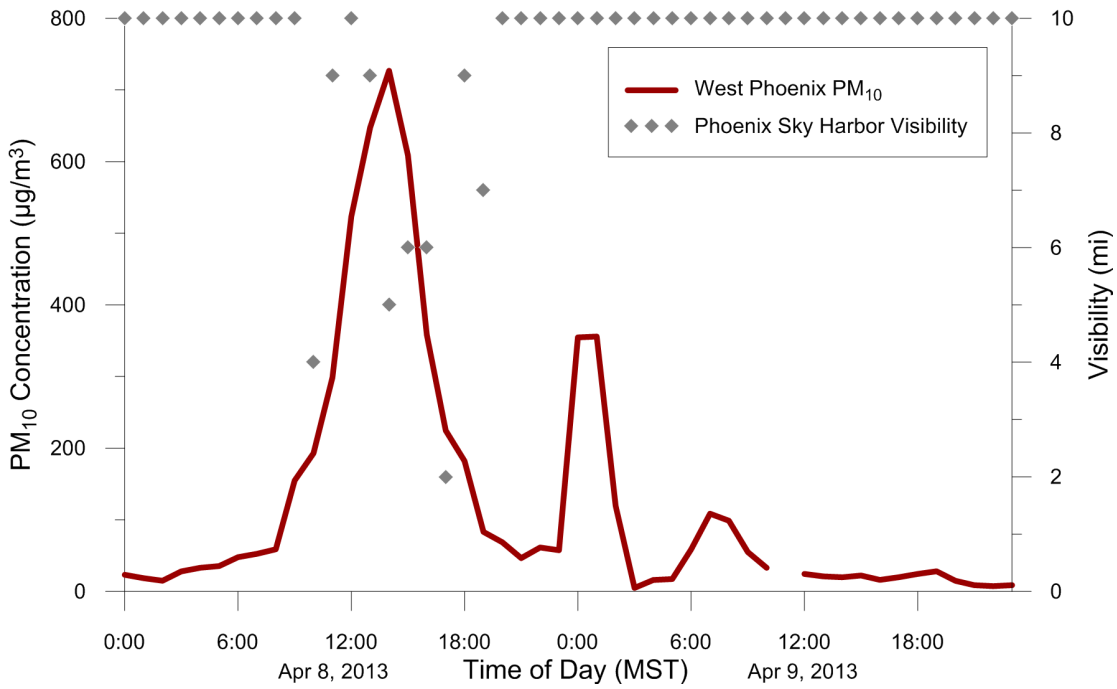

Figure A-44. Hourly PM_{10} concentrations at the West Phoenix monitor and visibility at Phoenix Sky Harbor International Airport on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the West Phoenix monitor, indicating the presence of windblown dust.

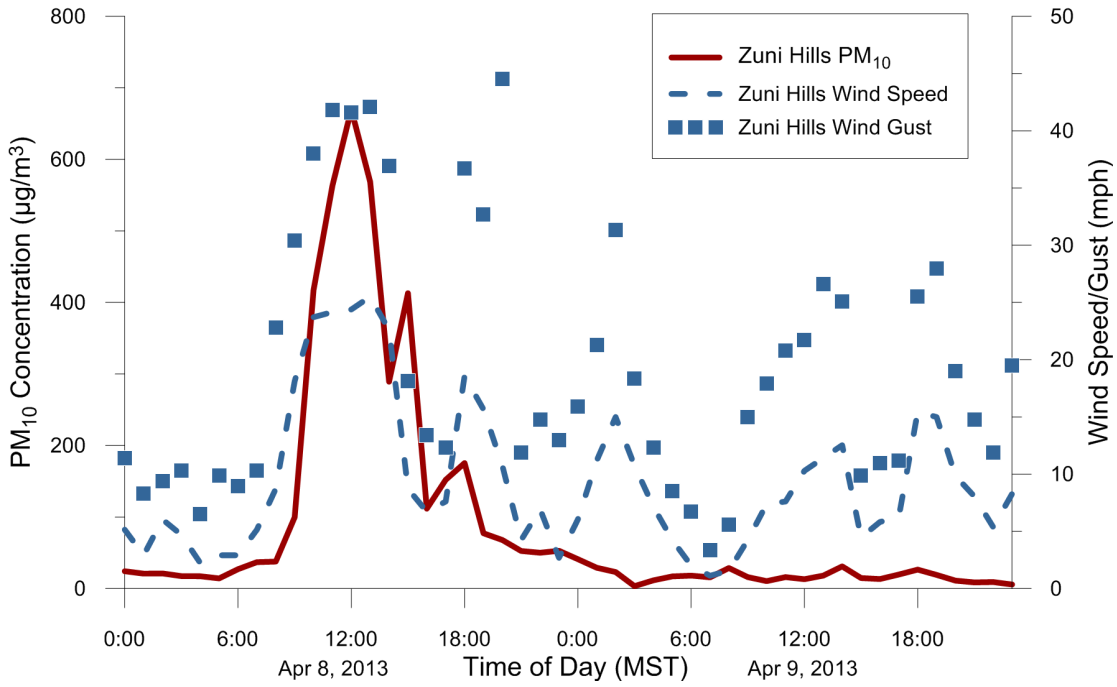

Figure A-45. Hourly PM_{10} concentrations and wind speeds at the Zuni Hills monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 10:00 MST on April 8, indicating the presence of windblown dust.

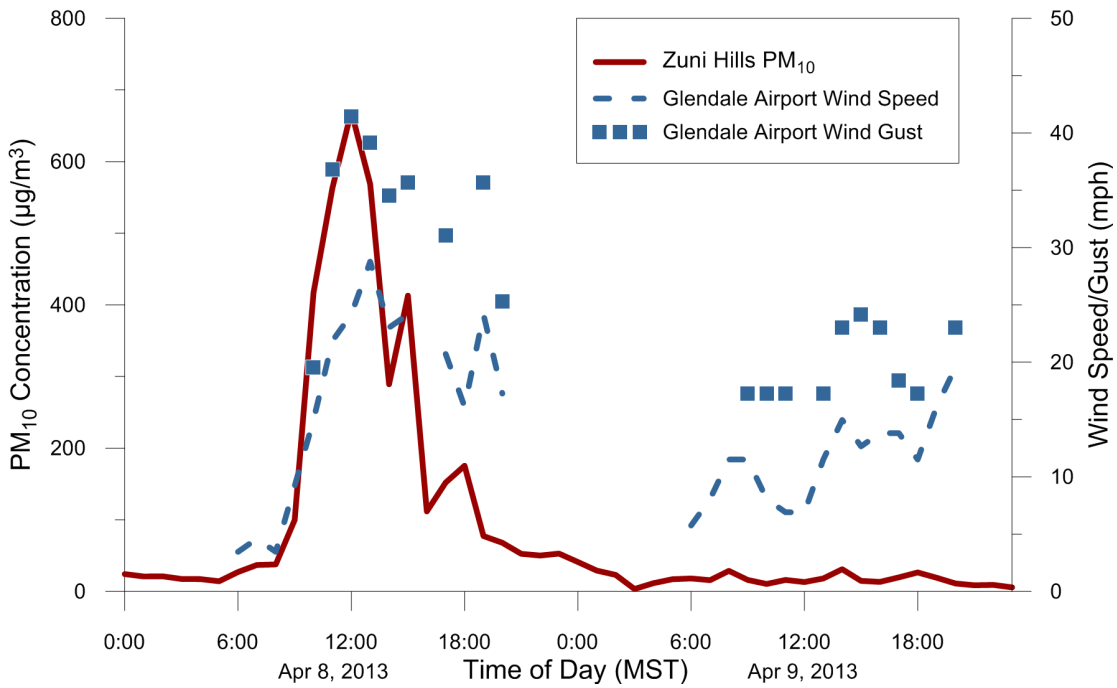

Figure A-46. Hourly PM_{10} concentrations at the Zuni Hills monitor and wind speeds at Glendale Municipal Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 10:00 MST on April 8, indicating the presence of windblown dust.

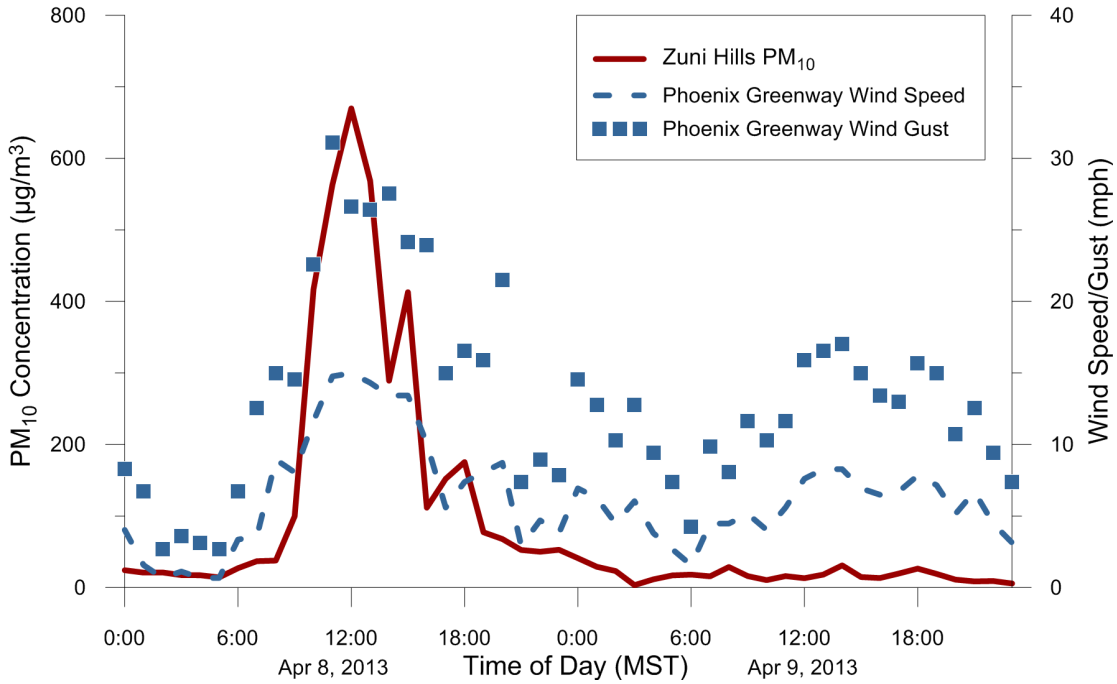

Figure A-47. Hourly PM_{10} concentrations at the Zuni Hills monitor and wind speeds at Phoenix Greenway on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 10:00 MST on April 8, indicating the presence of windblown dust.

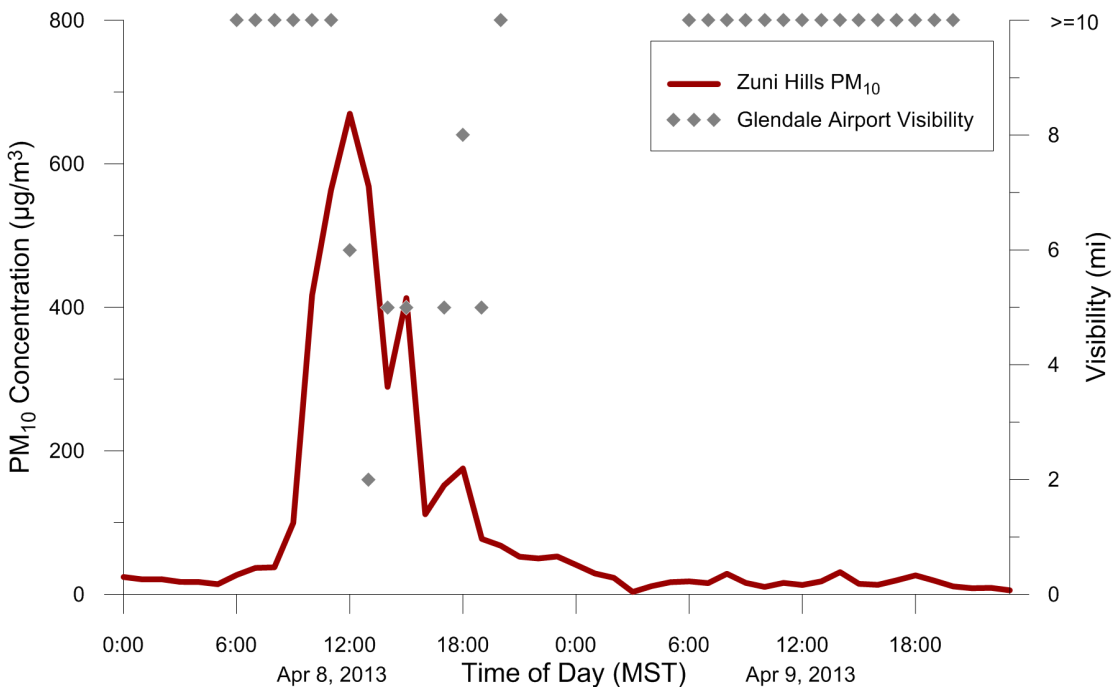

Figure A-48. Hourly PM_{10} concentrations at the Zuni Hills monitor and visibility at Glendale Municipal Airport on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the Zuni Hills monitor, indicating the presence of windblown dust.

Yuma

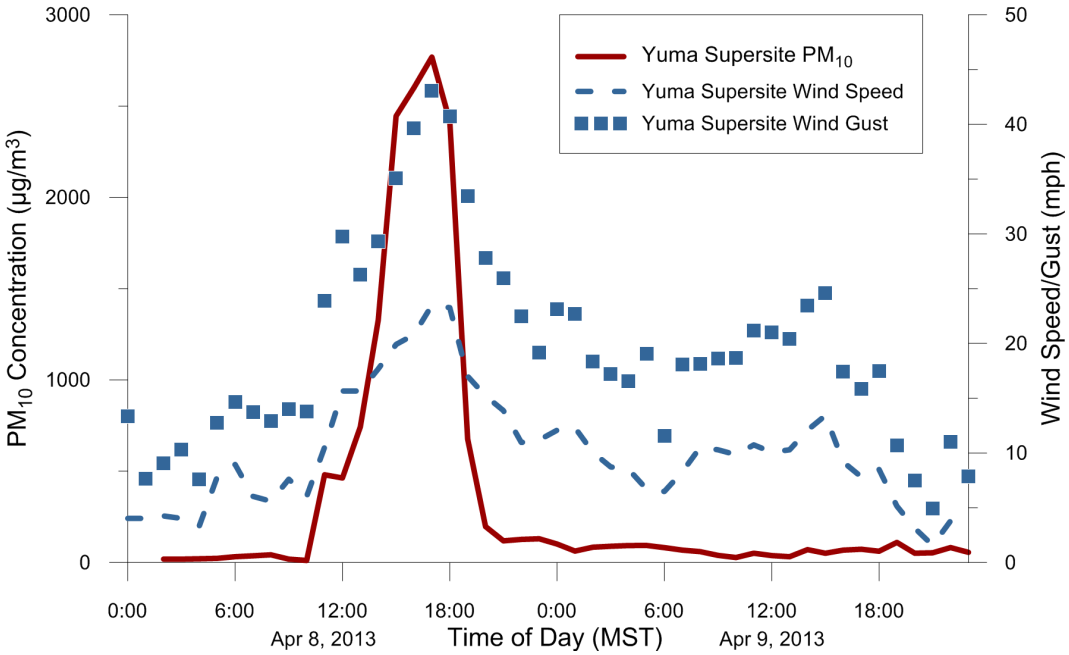

Figure A-49. Hourly PM_{10} concentrations and wind speeds at the Yuma Supersite monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 11:00 MST on April 8, indicating the presence of windblown dust.

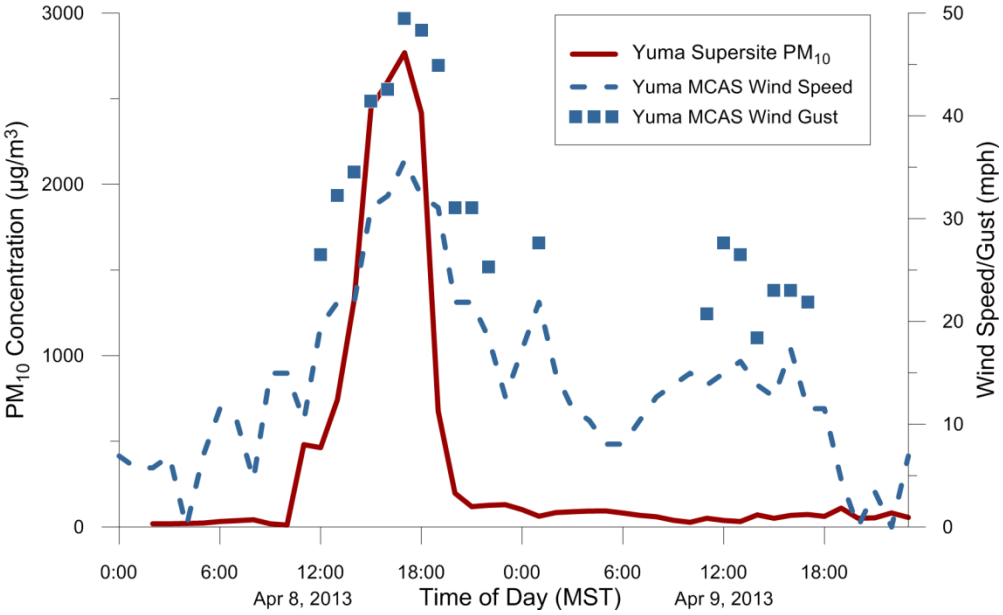

Figure A-50. Hourly PM_{10} concentrations at the Yuma Supersite monitor and wind speeds at Yuma MCAS International Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 11:00 MST on April 8, indicating the presence of windblown dust.

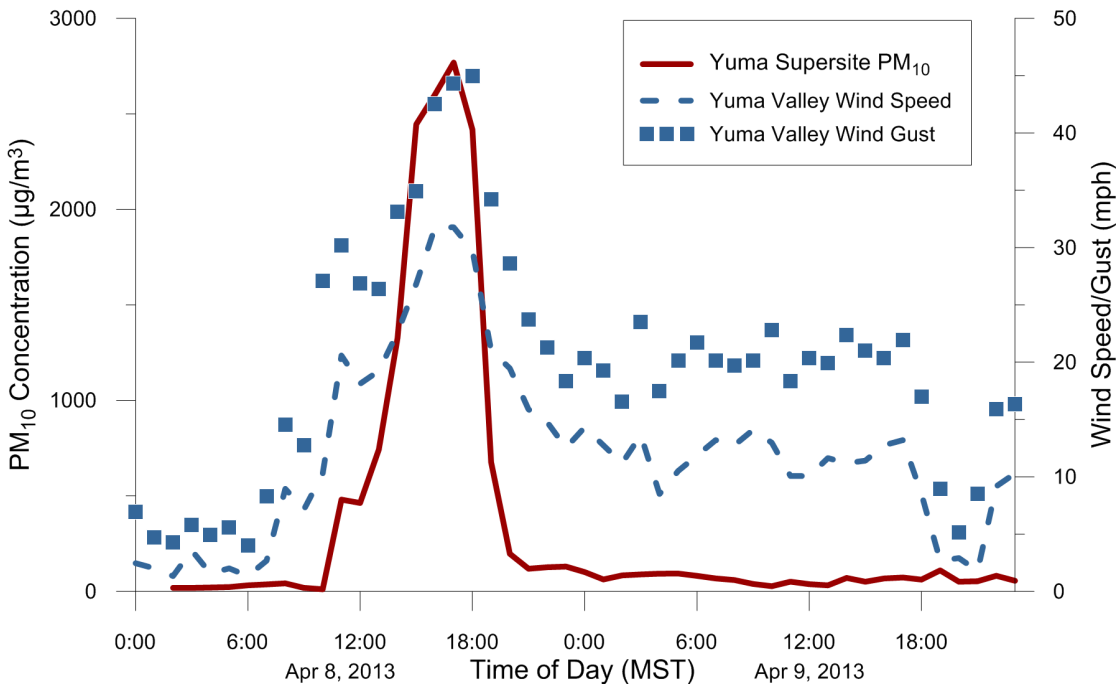

Figure A-51. Hourly PM_{10} concentrations at the Yuma Supersite monitor and wind speeds at Yuma Valley on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 11:00 MST on April 8, indicating the presence of windblown dust.

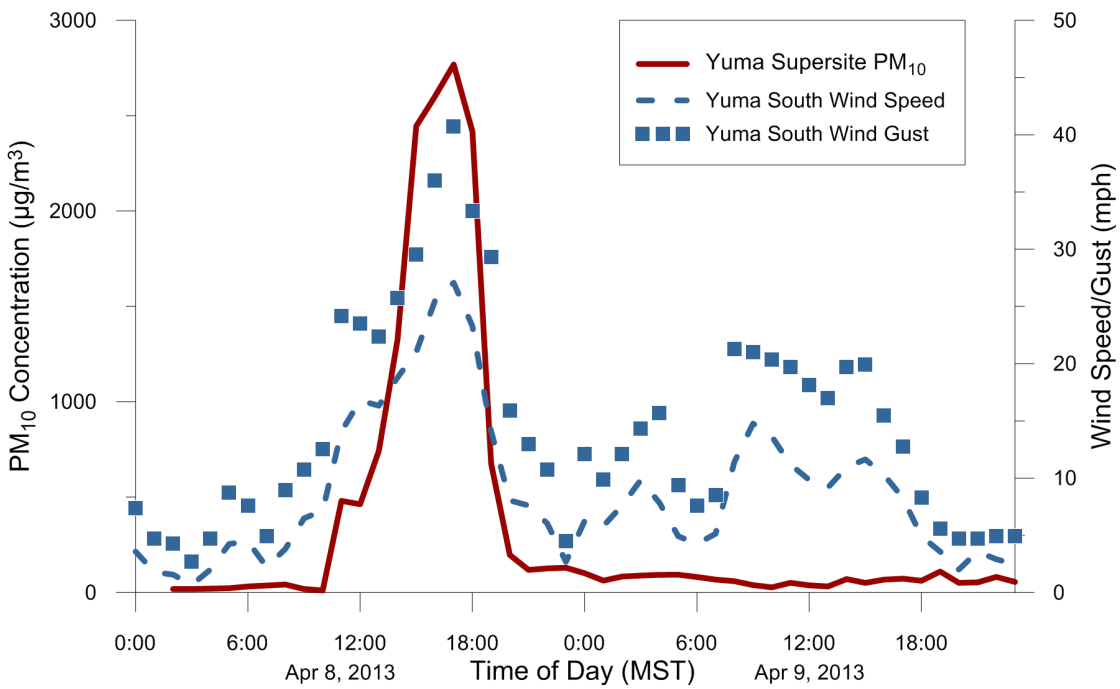

Figure A-52. Hourly PM_{10} concentrations at the Yuma Supersite monitor and wind speeds at Yuma South on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 11:00 MST on April 8, indicating the presence of windblown dust.

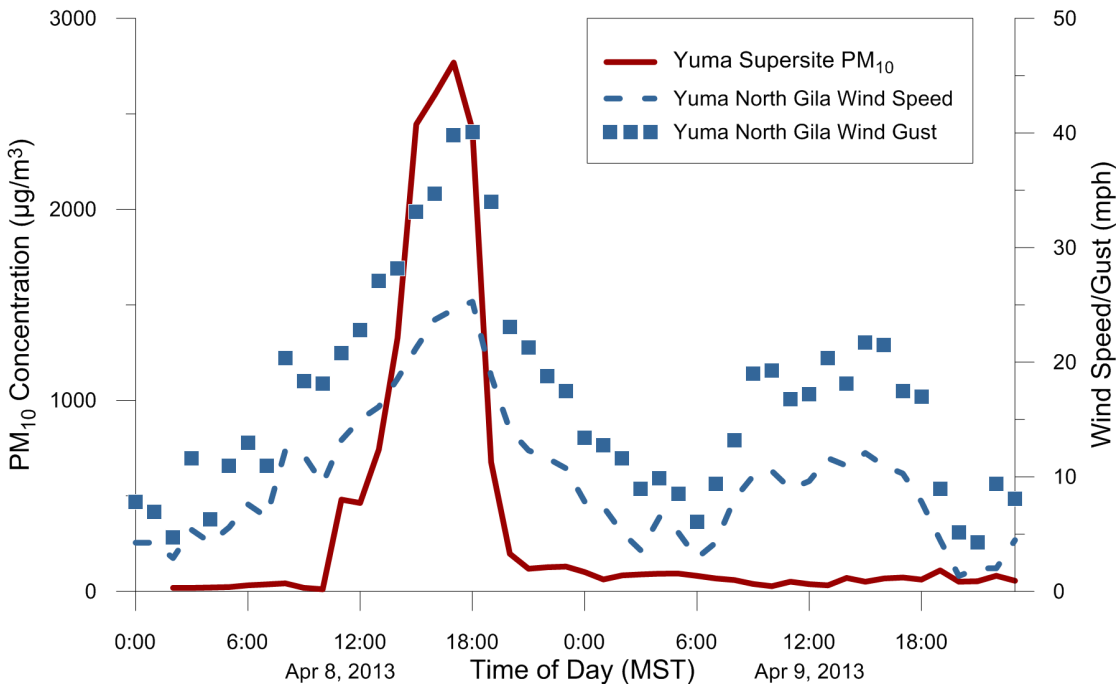

Figure A-53. Hourly PM_{10} concentrations at the Yuma Supersite monitor and wind speeds at Yuma North Gila on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at approximately 11:00 MST on April 8, indicating the presence of windblown dust.

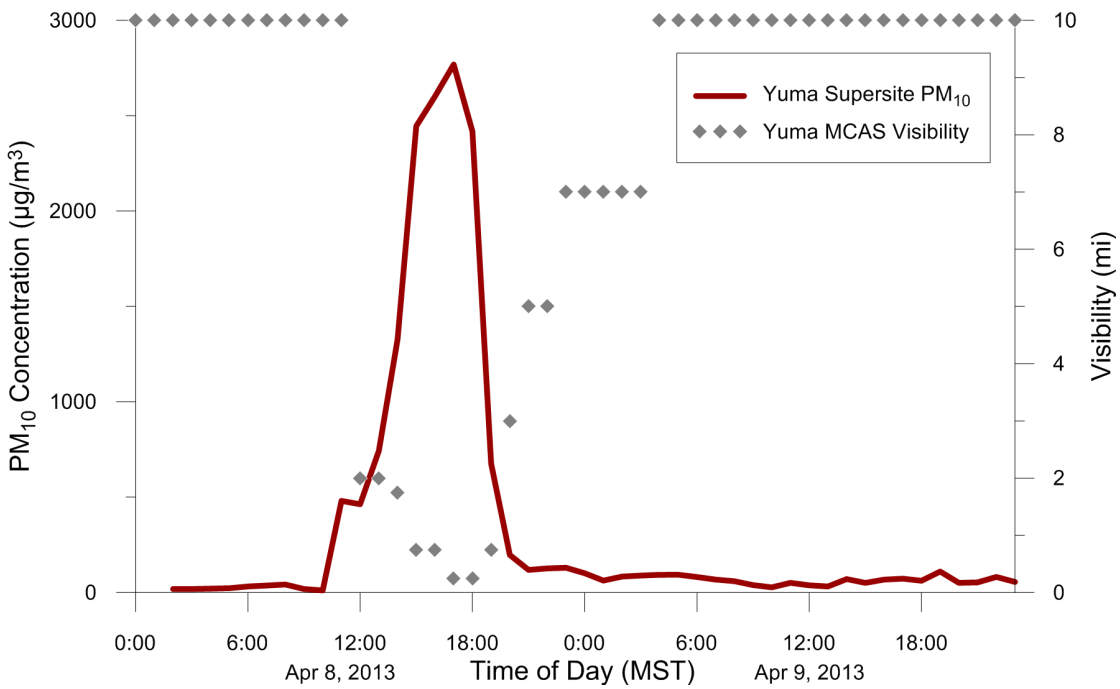

Figure A-54. Hourly PM_{10} concentrations at the Yuma Supersite monitor and visibility at Yuma MCAS on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the Yuma Supersite monitor, indicating the presence of windblown dust.

Ajo

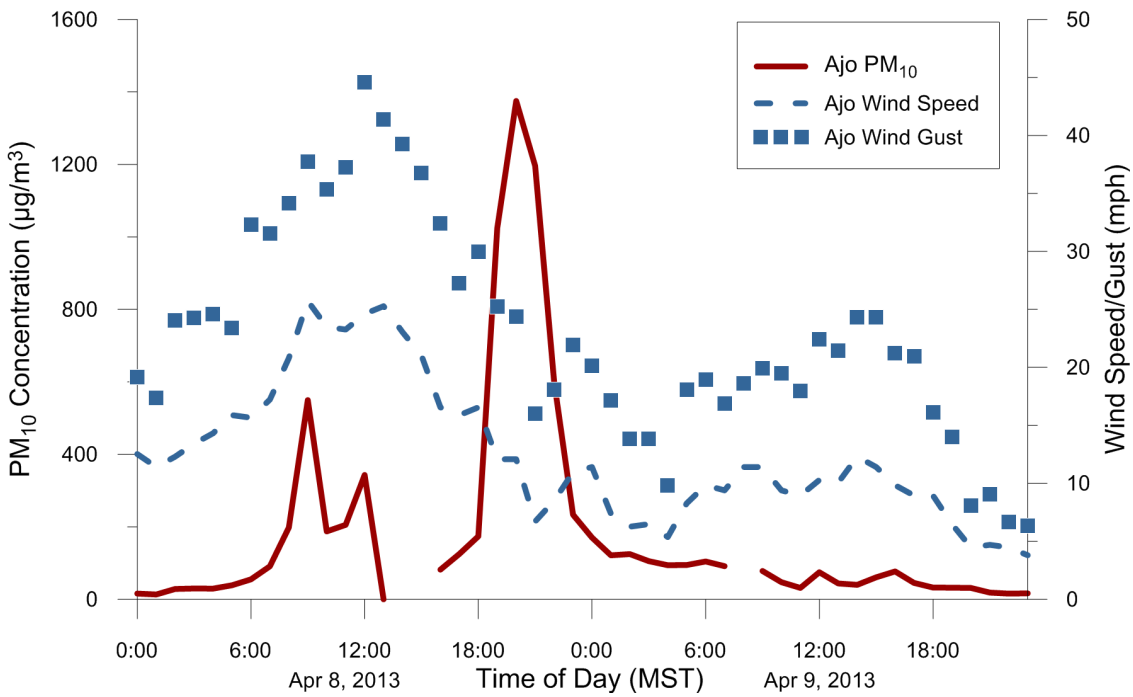

Figure A-55. Hourly PM_{10} concentrations and wind speeds at the Ajo monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST and again at 19:00 MST on April 8, indicating the presence of windblown dust. The second, higher peak in PM_{10} concentrations is attributable to transport of windblown dust from southeastern California, southwestern Arizona, and far northwestern Mexico.

Rillito/Pima County

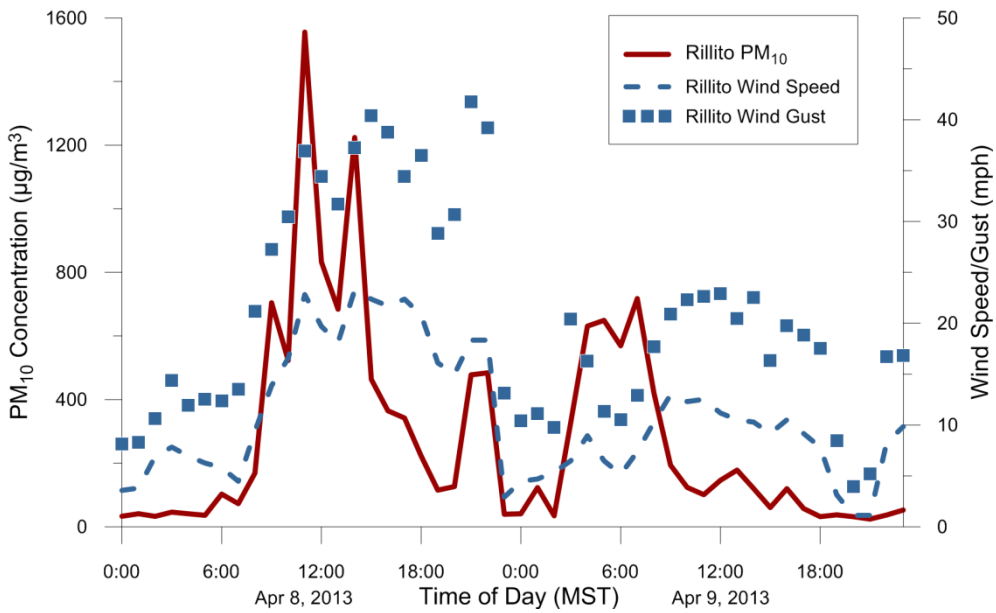

Figure A-56. Hourly PM_{10} concentrations and wind speeds at the Rillito monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 09:00 MST on April 8, indicating the presence of windblown dust. A second increase in PM_{10} occurred early on April 9, associated with transport of dust from the west.

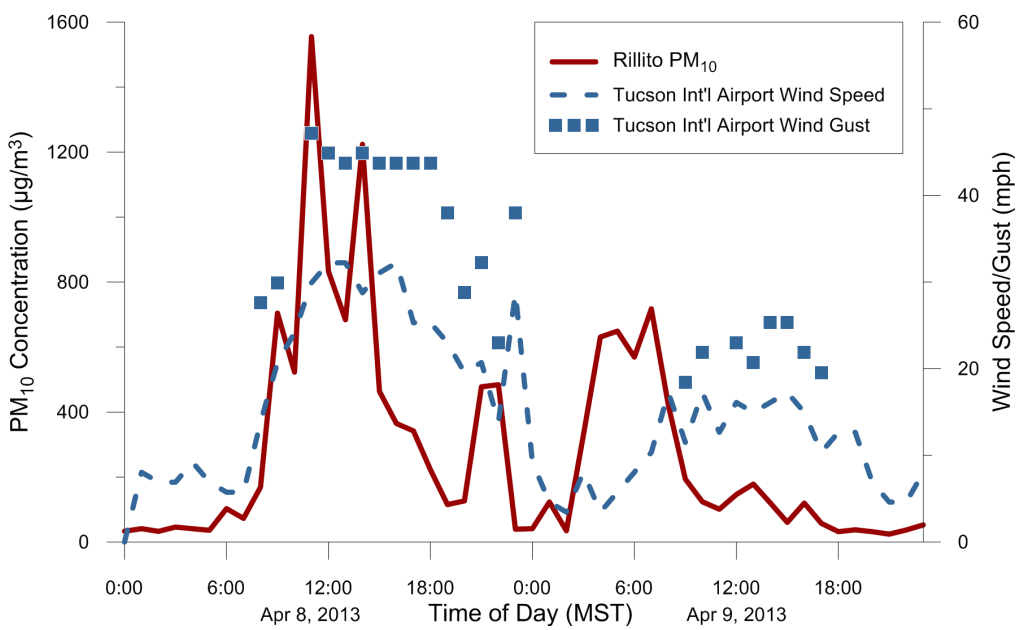

Figure A-57. Hourly PM_{10} concentrations at the Rillito monitor and wind speeds at Tucson International Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 09:00 MST on April 8, indicating the presence of windblown dust. A second increase in PM_{10} occurred early on April 9, associated with transport of dust from the west.

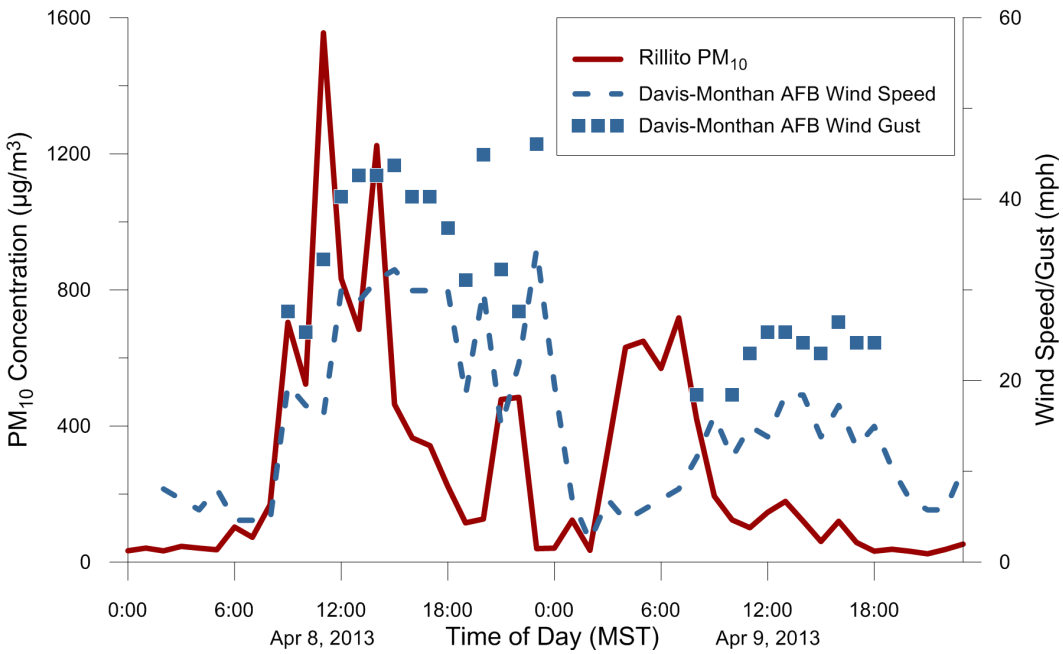

Figure A-58. Hourly PM_{10} concentrations at the Rillito monitor and wind speeds at Davis-Monthan AFB on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 09:00 MST on April 8, indicating the presence of windblown dust. A second increase in PM_{10} occurred early on April 9, associated with transport of dust from the west.

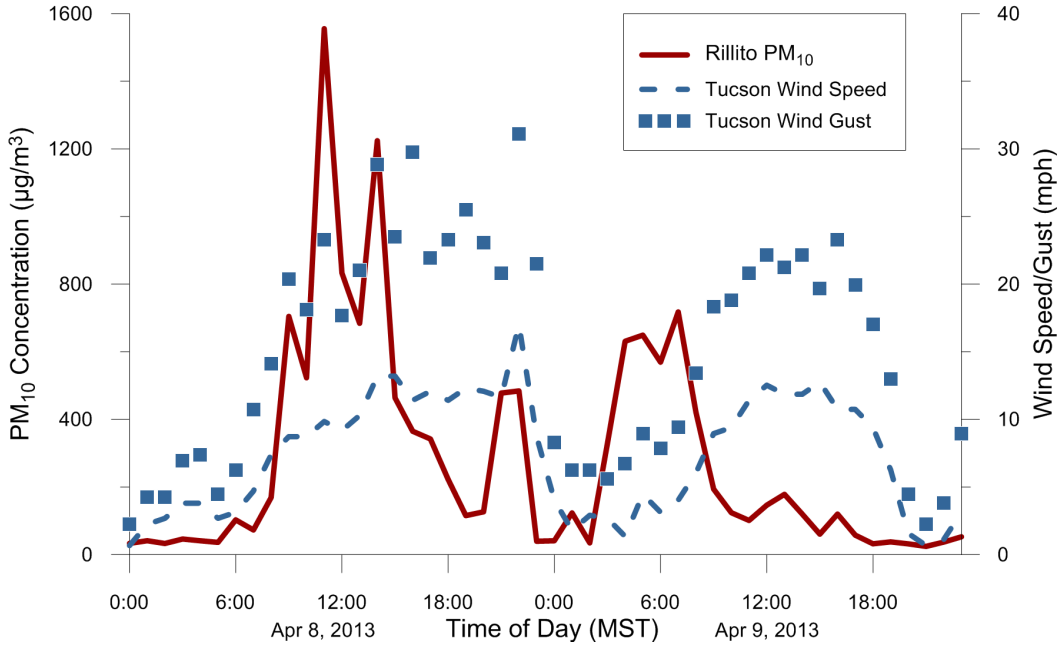

Figure A-59. Hourly PM_{10} concentrations at the Rillito monitor and wind speeds at the Tucson AZMET monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 09:00 MST on April 8, indicating the presence of windblown dust. A second increase in PM_{10} occurred early on April 9, associated with transport of dust from the west.

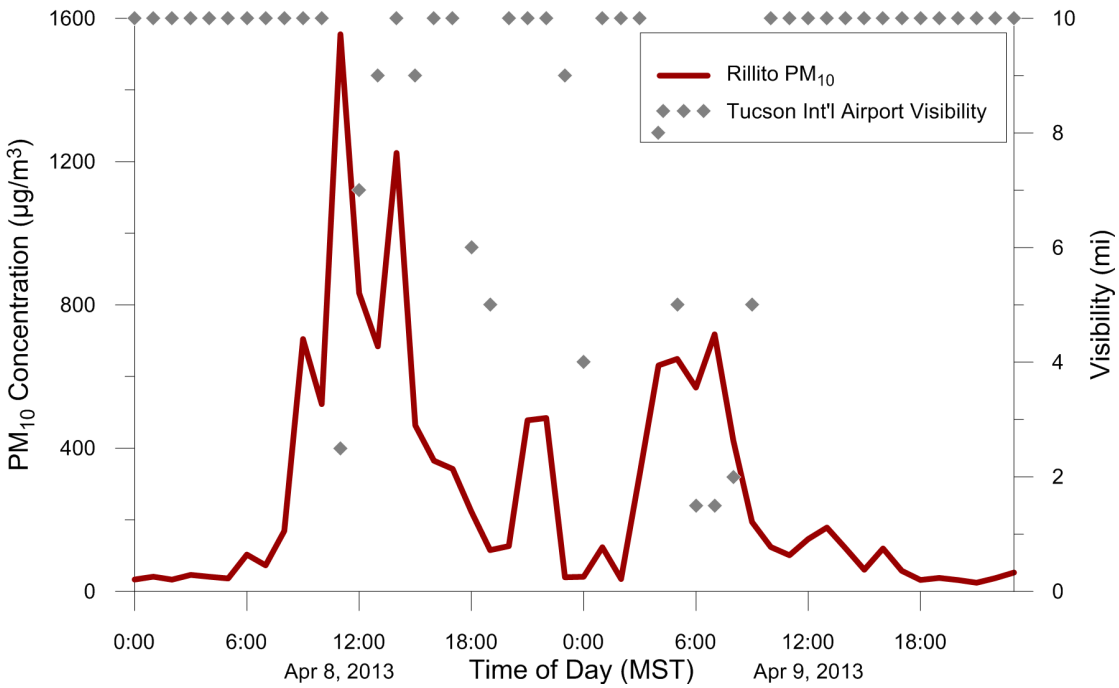

Figure A-60. Hourly PM_{10} concentrations at the Rillito monitor and visibility at Tucson International Airport on April 8 and 9, 2013. Visibility was greatly reduced, coincident with high PM_{10} concentrations at the Rillito monitor, indicating the presence of windblown dust. A second increase in PM_{10} occurred early on April 9, associated with transport of dust from the west.

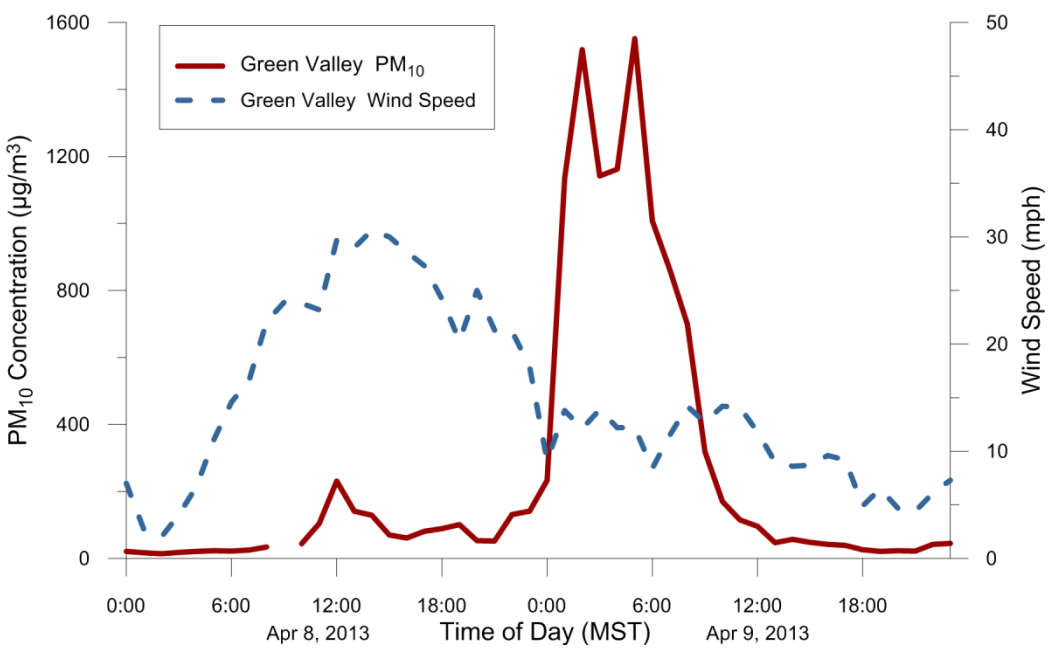

Figure A-61. Hourly PM_{10} concentrations and wind speeds at the Green Valley monitor on April 8 and 9, 2013. Dust lofted by strong winds in southeastern California, southwestern Arizona, and far northwestern Mexico on April 8 was transported into Green Valley early on April 9 and resulted in high PM_{10} concentrations.

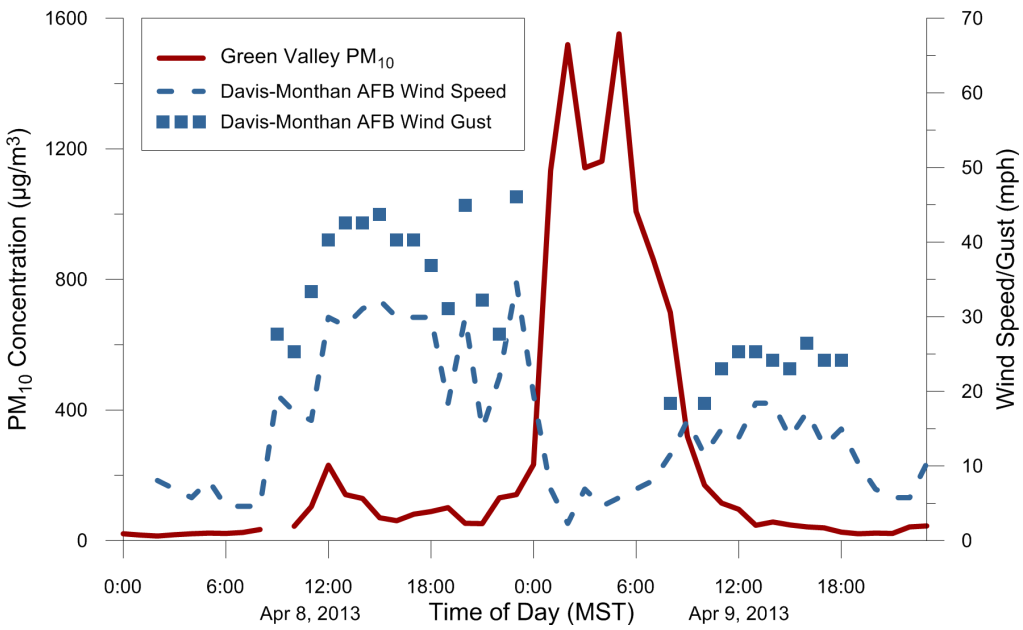

Figure A-62. Hourly PM_{10} concentrations at the Green Valley monitor and wind speeds at Davis-Monthan AFB Airport on April 8 and 9, 2013. Dust lofted by strong winds on April 8 was transported into Green Valley early on April 9 and resulted in high PM_{10} concentrations. Low wind speeds early on April 9 limited particle dispersion, resulting in high PM_{10} concentrations for several hours. Strong winds later on April 9 dispersed the residual suspended dust.

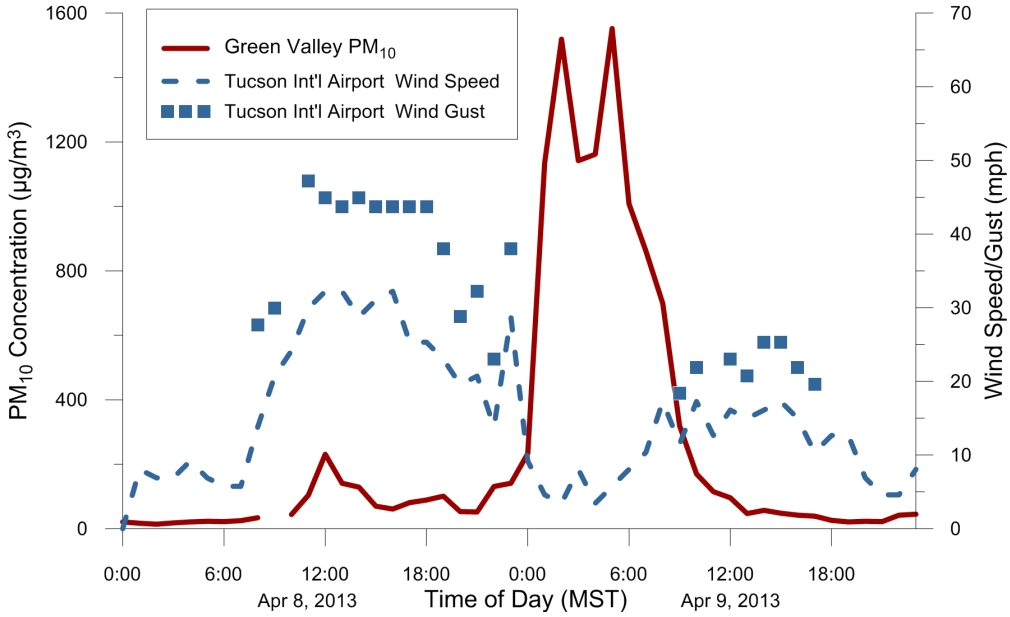

Figure A-63. Hourly PM_{10} concentrations at the Green Valley monitor and wind speeds at Tucson International Airport on April 8 and 9, 2013. Dust lofted by strong winds on April 8 was transported into Green Valley early on April 9 and resulted in high PM_{10} concentrations. Low wind speeds early on April 9 limited particle dispersion, resulting in high PM_{10} concentrations for several hours. Strong winds later on April 9 dispersed the residual suspended dust.

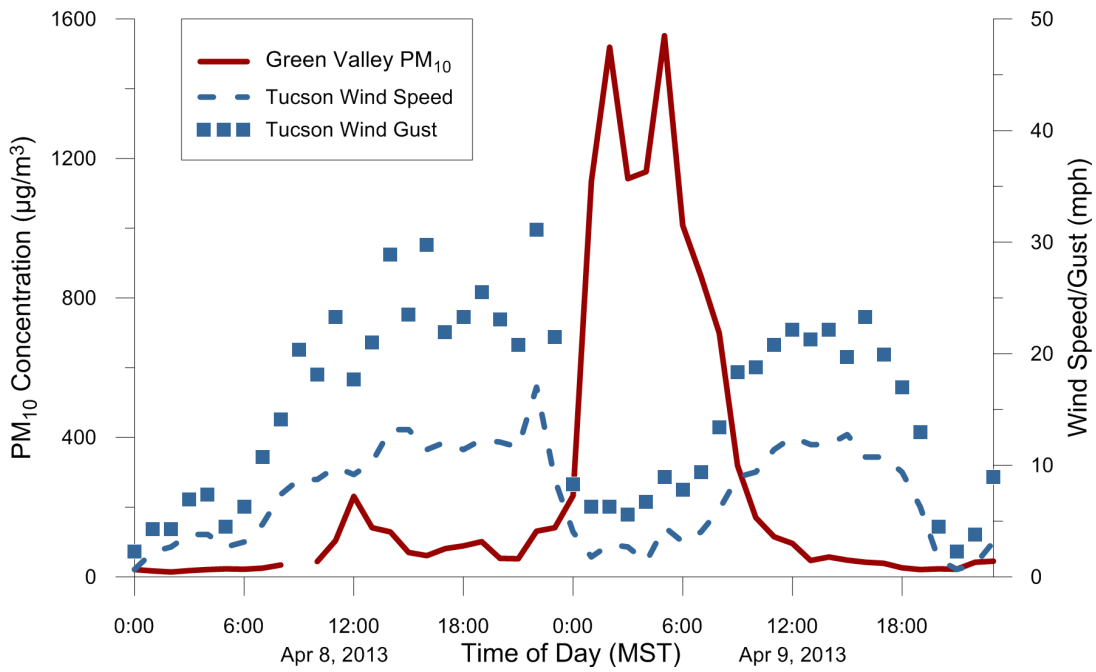

Figure A-64. Hourly PM_{10} concentrations at the Green Valley monitor and wind speeds at the Tucson AZMET monitor on April 8 and 9, 2013. Dust lofted by strong winds on April 8 was transported into Green Valley early on April 9 and resulted in high PM_{10} concentrations. Low wind speeds early on April 9 limited particle dispersion, resulting in high PM_{10} concentrations for several hours. Strong winds later on April 9 dispersed the residual suspended dust.

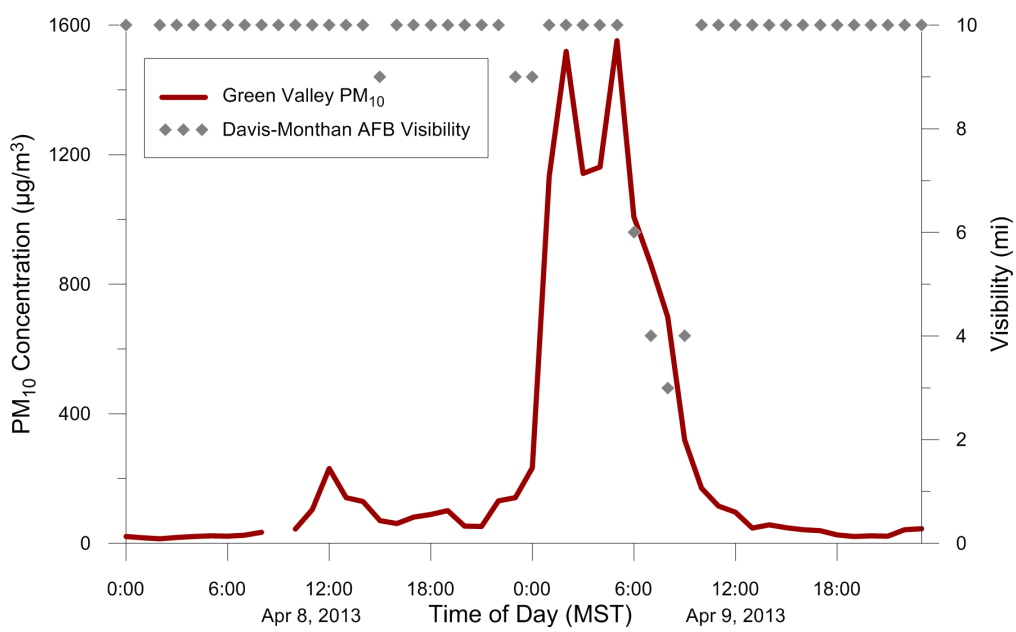

Figure A-65. Hourly PM_{10} concentrations at the Green Valley monitor and visibility at Davis-Monthan AFB on April 8 and 9, 2013. Dust lofted by strong winds on April 8 was transported into Green Valley early on April 9 and resulted in high PM_{10} concentrations and low visibilities.

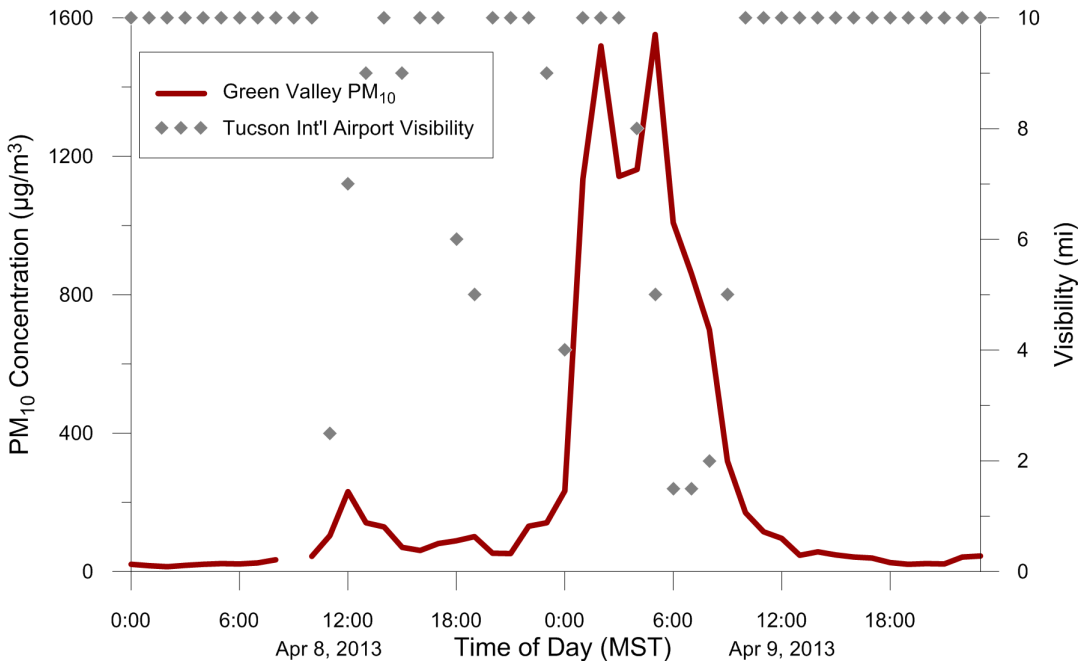

Figure A-66. Hourly PM_{10} concentrations at the Green Valley monitor and visibility at Tucson International Airport on April 8 and 9, 2013. Dust lofted by strong winds on April 8 was transported into Green Valley early on April 9 and resulted in high PM_{10} concentrations and low visibilities.

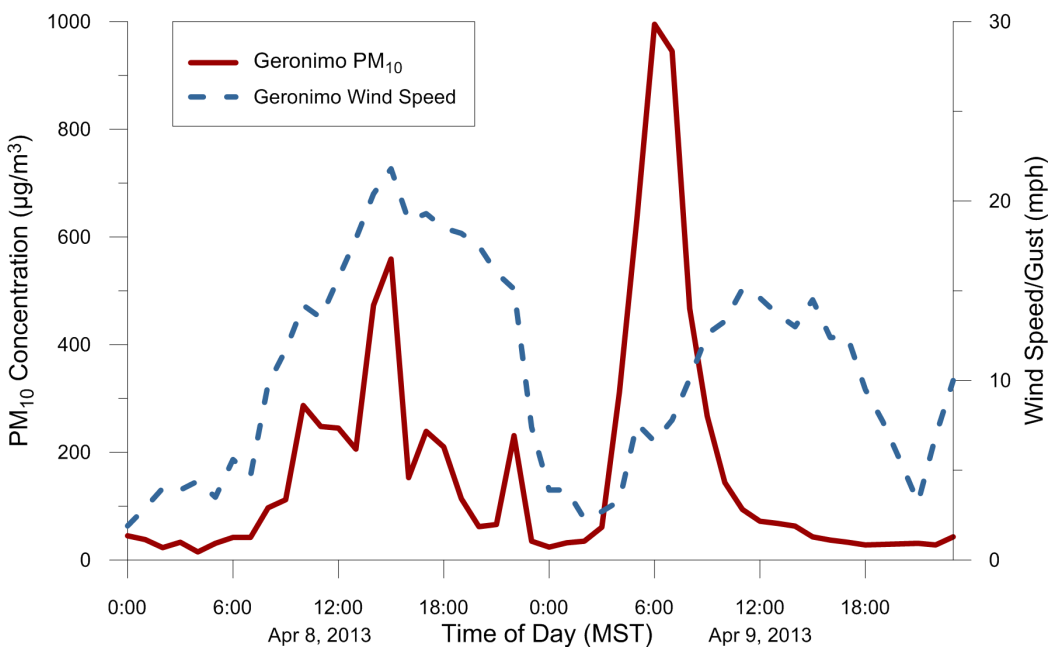

Figure A-67. Hourly PM_{10} concentrations and wind speeds at the Geronimo monitor on April 8 and 9, 2013. Strong winds and high PM_{10} concentrations were reported during the late morning and afternoon hours on April 8. Additional dust lofted by strong winds in southeastern California, southwestern Arizona, and far northwestern Mexico on April 8 was transported into Green Valley early on April 9 and resulted in high PM_{10} concentrations.

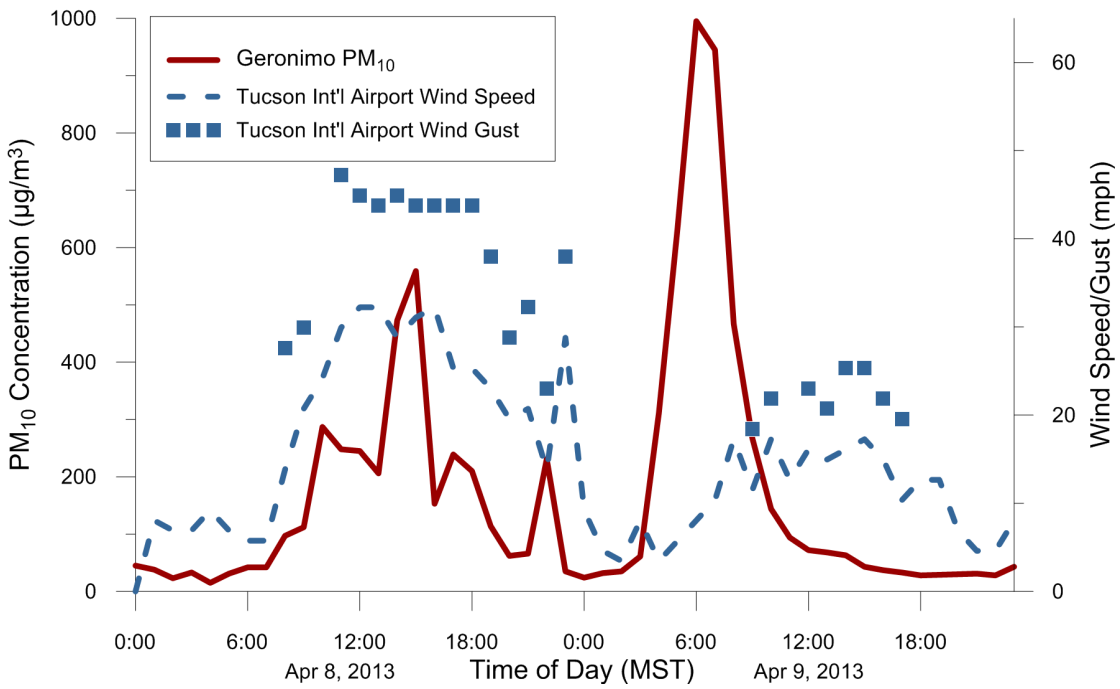

Figure A-68. Hourly PM_{10} concentrations at the Geronimo monitor and wind speeds at Tucson International Airport on April 8 and 9, 2013. Strong winds and high PM_{10} concentrations were reported during the late morning and afternoon hours on April 8. Additional dust lofted by strong winds in southeastern California, southwestern Arizona, and far northwestern Mexico on April 8 was transported into Green Valley early on April 9 and resulted in high PM_{10} concentrations.

Hayden and Miami

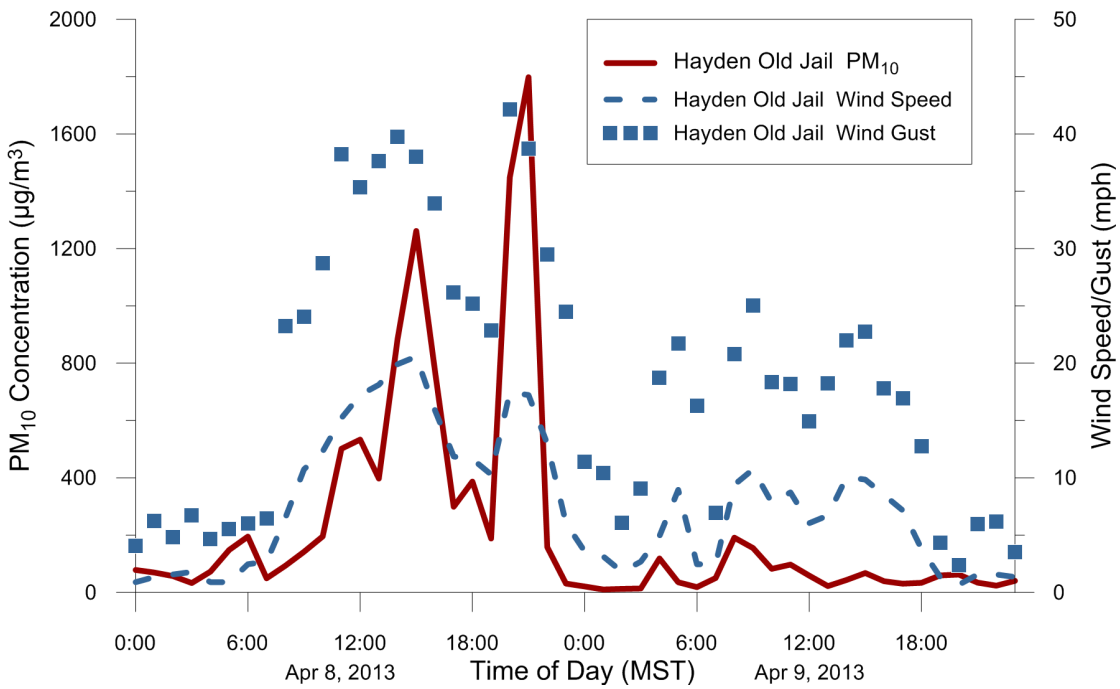

Figure A-69. Hourly PM_{10} concentrations and wind speeds at the Hayden Old Jail monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds increased at approximately 10:00 MST on April 8, indicating the presence of windblown dust.

Nogales

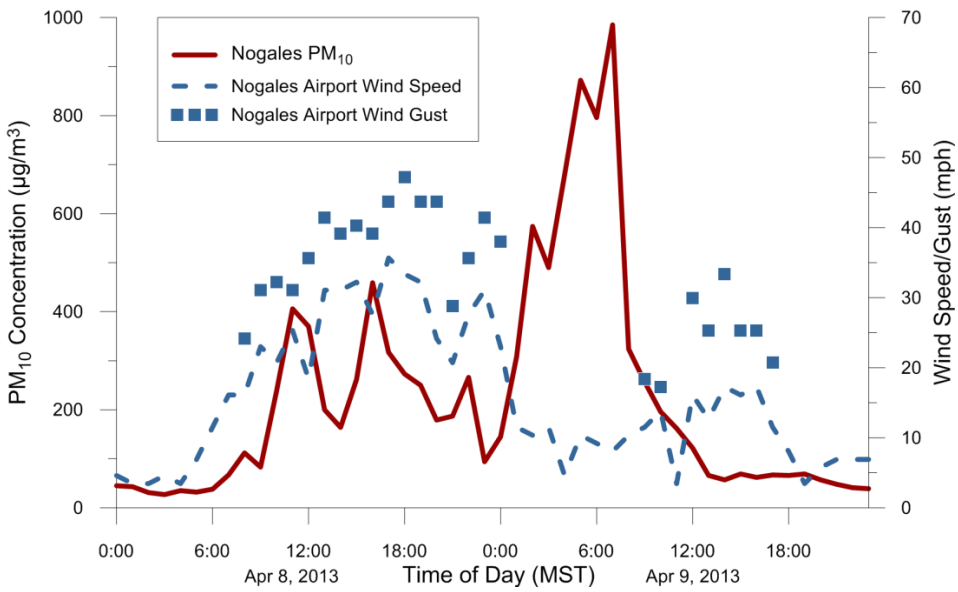

Figure A-70. Hourly PM_{10} concentrations at the Nogales monitor and wind speeds at Nogales Airport on April 8 and 9, 2013. High PM_{10} concentrations were reported after midnight on April 9 while wind speeds were low. The PM_{10} is attributable to dust transported into the region from the west.

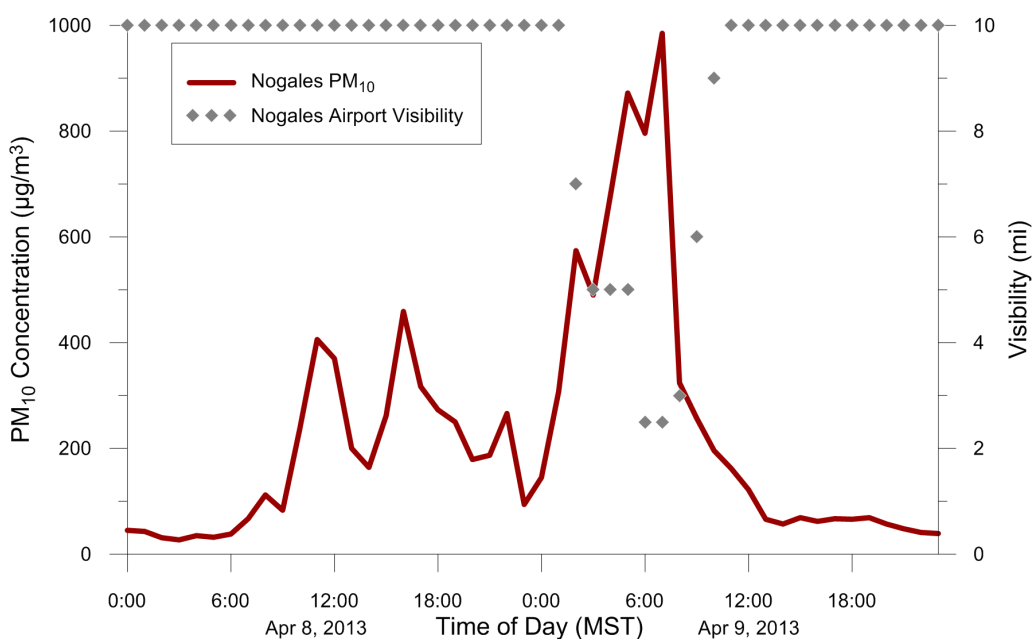

Figure A-71. Hourly PM_{10} concentrations at the Nogales monitor and visibilities at Nogales Airport on April 8 and 9, 2013. High PM_{10} concentrations were reported after midnight on April 9 coincident with low visibilities. The PM_{10} is attributable to dust transported into the region from the west.

Douglas

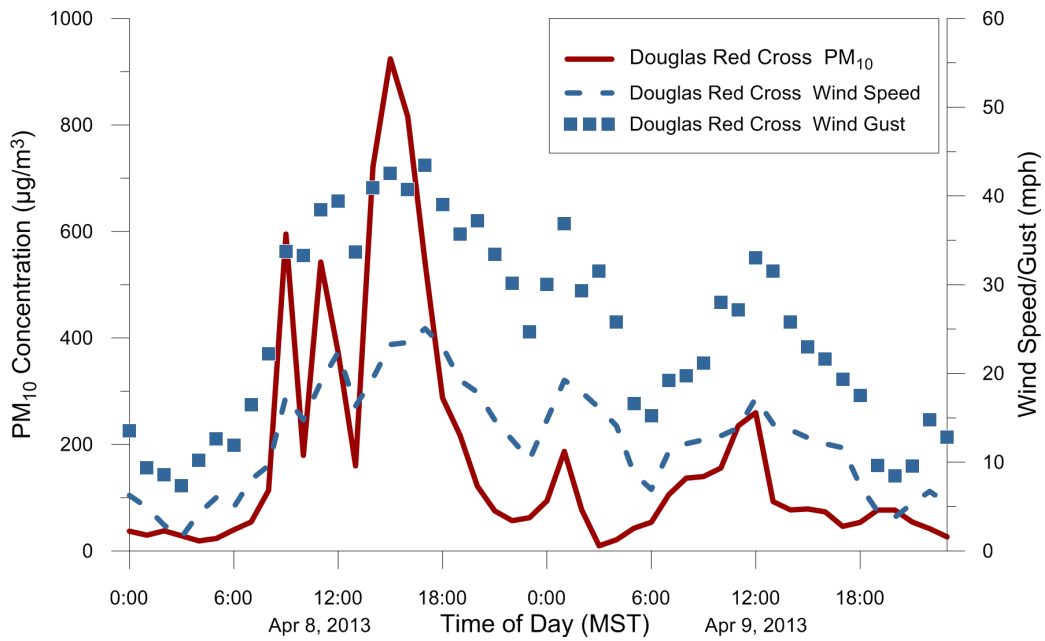

Figure A-72. Hourly PM_{10} concentrations and wind speeds at the Douglas Red Cross monitor on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 08:00 MST on April 8, indicating the presence of windblown dust.

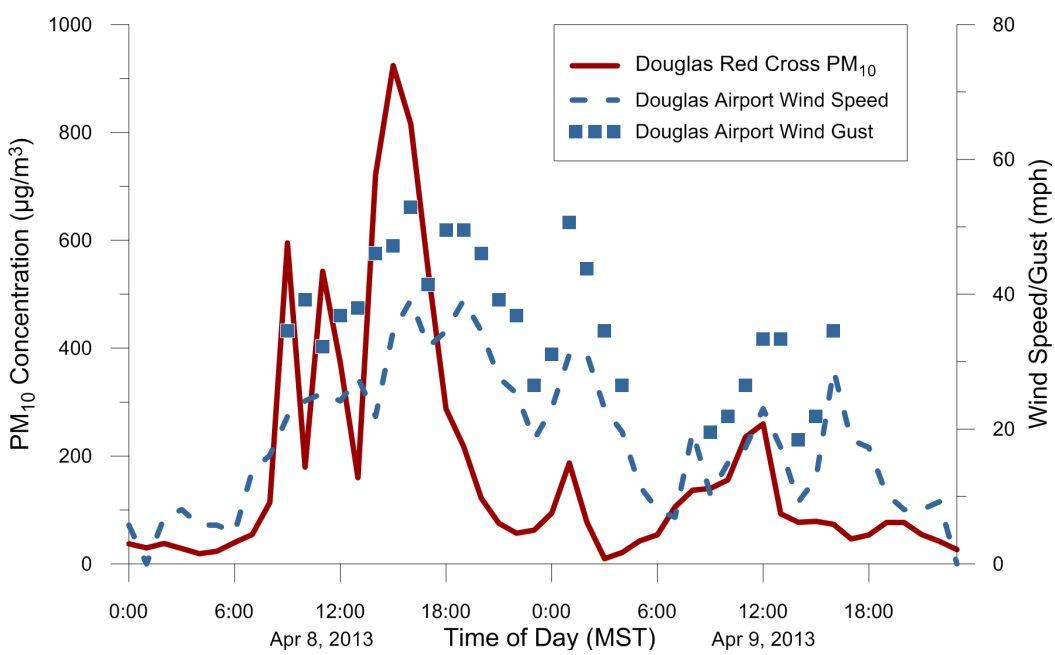

Figure A-73. Hourly PM_{10} concentrations at the Douglas Red Cross monitor and wind speeds at Bisbee-Douglas International Airport on April 8 and 9, 2013. PM_{10} concentrations and wind speeds sharply increased at 8:00 MST on April 8, indicating the presence of windblown dust.

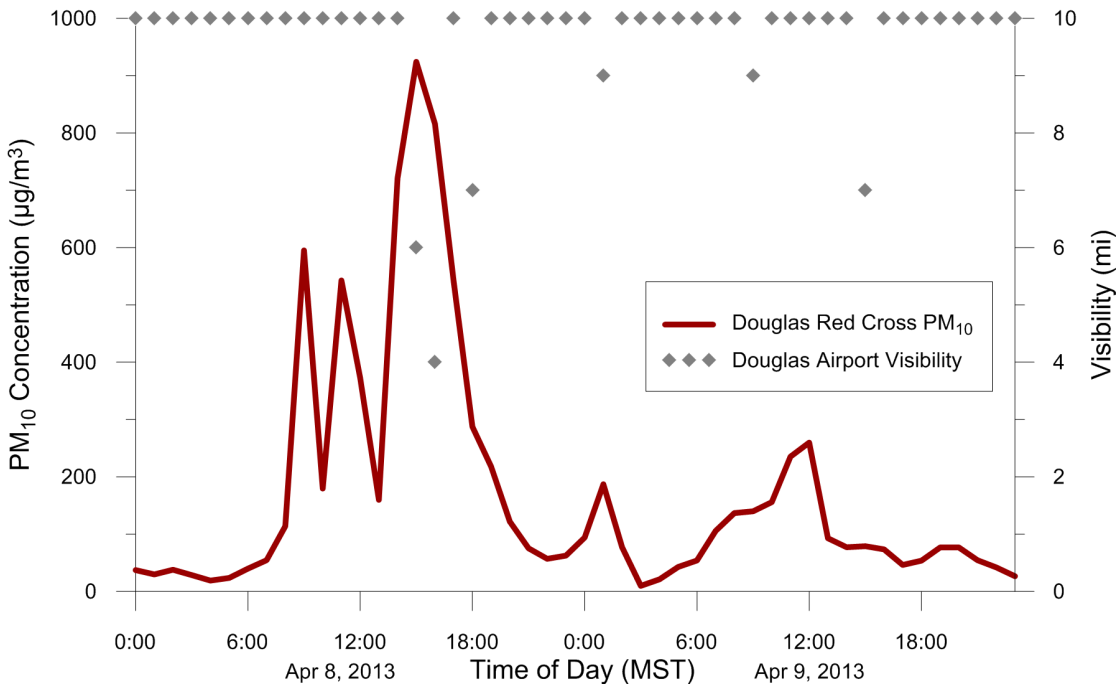

Figure A-74. Hourly PM_{10} concentrations at the Douglas Red Cross monitor and visibility at Bisbee-Douglas International Airport on April 8 and 9, 2013. Visibility was reduced during the afternoon hours on April 8, coincident with high PM_{10} concentrations at the Douglas Red Cross monitor, indicating the presence of windblown dust.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
BISBEE DOUGLAS INTL ARPT (93026)
DOUGLAS BISBEE, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 4105 ft. above sea level
Latitude: 31.458
Longitude: -109.606

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0056	12	CLR	10.00		55	12.8	41	5.0	23	-5.0	29	0	000		25.69			29.69	AA		29.86
08	0156	12	CLR	10.00		59	15.0	44	6.7	27	-2.8	29	7	VR		25.68	6	009	29.67	AA		29.85
08	0256	12	CLR	10.00		56	13.3	43	6.1	28	-2.2	34	8	210		25.68			29.67	AA		29.85
08	0356	12	CLR	10.00		56	13.3	45	7.1	33	0.6	42	6	180		25.66			29.65	AA		29.83
08	0456	12	CLR	10.00		51	10.6	41	5.0	29	-1.7	43	6	140		25.65	8	010	29.65	AA		29.82
08	0556	12	CLR	10.00		51	10.6	42	5.6	32	0.0	48	5	150		25.64			29.65	AA		29.81
08	0656	12	CLR	10.00		57	13.9	44	6.8	30	-1.1	36	14	180		25.66			29.66	AA		29.83
08	0756	12	CLR	10.00		63	17.2	46	7.7	27	-2.8	26	16	150		25.65	8	001	29.65	AA		29.82
08	0856	12	CLR	10.00		68	20.0	50	9.7	31	-0.6	25	22	180	34	25.63			29.63	AA		29.80
08	0956	12	CLR	10.00		70	21.1	50	10.0	30	-1.1	23	24	190	39	25.61			29.61	AA		29.77
08	1056	12	CLR	10.00		74	23.3	51	10.7	29	-1.7	19	25	200	32	25.59	8	020	29.57	AA		29.75
08	1156	12	CLR	10.00		77	25.0	53	11.4	29	-1.7	17	24	220	37	25.56			29.52	AA		29.71
08	1256	12	CLR	10.00		77	25.0	53	11.4	29	-1.7	17	28	200	38	25.54			29.51	AA		29.69
08	1356	12	CLR	10.00		78	25.6	53	11.4	28	-2.2	16	22	210	46	25.50	7	030	29.46	AA		29.65
08	1456	12	FEW005 BKN019	6.00	HZ	79	26.1	53	11.6	28	-2.2	15	34	230	47	25.46			29.42	AA		29.60
08	1548	12	BKN013	4.00	HZ	79	26.0	54	12.0	30	-1.0	17	37	220	53	25.42			M	SP		29.56
08	1556	12	BKN015	8.00		77	25.0	54	12.1	33	0.6	20	36	210	51	25.42			29.38	AA		29.56
08	1603	12	SCT015	8.00		77	25.0	53	11.5	30	-1.0	18	39	210	51	25.43			M	SP		29.57
08	1656	12	CLR	10.00		75	23.9	53	11.8	34	1.1	22	32	210	41	25.42	5	025	29.40	AA		29.56
08	1756	12	CLR	7.00		71	21.7	52	11.1	35	1.7	27	34	200	49	25.40			29.39	AA		29.54
08	1856	12	CLR	10.00		67	19.4	50	9.8	33	0.6	28	39	200	49	25.40			29.38	AA		29.54
08	1956	12	CLR	10.00		65	18.3	50	9.8	35	1.7	33	34	190	46	25.42	5	001	29.39	AA		29.56
08	2056	12	CLR	10.00		62	16.7	48	8.6	33	0.6	34	28	200	39	25.44			29.42	AA		29.58
08	2156	12	CLR	10.00		60	15.6	45	7.3	29	-1.7	31	25	200	37	25.43			29.40	AA		29.57
08	2256	12	CLR	10.00		59	15.0	44	6.5	26	-3.3	28	18	200	26	25.45	1	010	29.41	AA		29.59
08	2356	12	CLR	10.00		56	13.3	45	7.1	33	0.6	42	23	240	31	25.46			29.42	AA		29.60

Figure A-75. Quality-controlled local climatological data hourly observations table for Bisbee Douglas International Airport, Douglas Bisbee, AZ (04/08/2013). Note in the Weather Type column that HZ (haze) was reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
BISBEE DOUGLAS INTL ARPT (93026)
DOUGLAS BISBEE, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 4105 ft. above sea level
Latitude: 31.458
Longitude: -109.606
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0056	12	CLR	9.00		54	12.2	44	6.8	34	1.1	47	31	230	51	25.48			29.46	AA		29.63
09	0156	12	BKN055 BKN070 OVC085	10.00		50	10.0	44	6.4	37	2.8	61	31	270	44	25.52	3	023	29.51	AA		29.67
09	0256	12	FEW037 BKN070 OVC085	10.00		47	8.3	42	5.6	37	2.8	68	23	240	34	25.53			29.53	AA		29.68
09	0356	12	CLR	10.00		47	8.3	42	5.6	37	2.8	68	20	230	26	25.54			29.54	AA		29.69
09	0456	12	FEW055	10.00		46	7.8	41	4.9	35	1.7	66	11	260		25.56	3	015	29.57	AA		29.72
09	0556	12	FEW043 BKN050	10.00		43	6.1	39	4.0	35	1.7	73	8	270		25.58			29.62	AA		29.74
09	0656	12	OVC075	10.00		46	7.8	41	4.9	35	1.7	66	7	240		25.60			29.64	AA		29.76
09	0756	12	FEW036	10.00		50	10.0	42	5.5	33	0.6	52	20	240		25.62	1	018	29.65	AA		29.78
09	0856	12	SCT034	9.00		51	10.6	41	5.2	30	-1.1	45	10	260	20	25.63			29.68	AA		29.80
09	0956	12	FEW041 SCT055	10.00		53	11.7	42	5.5	29	-1.7	40	15	250	22	25.64			29.68	AA		29.81
09	1056	12	SCT060 BKN085	10.00		57	13.9	43	6.2	27	-2.8	32	17	250	26	25.64	0	009	29.67	AA		29.81
09	1156	12	BKN065 OVC090	10.00	-RA	58	14.4	44	6.5	27	-2.8	31	23	270	33	25.63			29.67	AA	T	29.80
09	1256	12	OVC065	10.00		52	11.1	40	4.7	26	-3.3	37	17	330	33	25.65			29.71	AA		29.82
09	1356	12	SCT080 BKN100	10.00		57	13.9	41	5.0	20	-6.7	24	3	VR		25.64	0	001	29.70	AA		29.81
09	1420	12	BKN080 OVC090	10.00	-RA	54	12.0	42	5.6	28	-2.0	37	9	010	18	25.64			M	SP		29.81
09	1454	12	FEW040 BKN065 OVC090	7.00	-RA	54	12.0	44	6.8	34	1.0	47	9	230	22	25.65			M	SP		29.82
09	1456	12	BKN065 OVC085	10.00		53	11.7	44	6.6	34	1.1	49	13	230		25.65			29.72	AA	0.01	29.82
09	1556	12	SCT110	10.00		55	12.8	43	6.1	29	-1.7	37	29	270	34	25.66			29.73	AA		29.83
09	1656	12	FEW090	10.00		56	13.3	43	6.1	28	-2.2	34	18	260		25.67	3	006	29.74	AA		29.84
09	1756	12	CLR	10.00		54	12.2	41	5.0	25	-3.9	33	17	240		25.68			29.76	AA		29.85
09	1856	12	CLR	10.00		51	10.6	41	4.8	28	-2.2	41	10	260		25.69			29.77	AA		29.86
09	1956	12	BKN075	10.00		49	9.4	40	4.4	29	-1.7	46	8	260		25.71	3	013	29.79	AA		29.88
09	2056	12	CLR	10.00		46	7.8	39	3.6	29	-1.7	52	8	230		25.73			29.82	AA		29.91
09	2156	12	BKN080	10.00		47	8.3	40	4.5	32	0.0	56	9	260		25.75			29.84	AA		29.93
09	2256	12	CLR	10.00		45	7.2	39	3.7	31	-0.6	58	0	000		25.76	1	019	29.85	AA		29.94
09	2356	12	CLR	10.00		42	5.6	37	2.6	30	-1.1	63	3	110		25.77			29.86	AA		29.95

Figure A-76. Quality-controlled local climatological data hourly observations table for Bisbee Douglas International Airport, Douglas Bisbee, AZ (04/09/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
CHANDLER MUNICIPAL AIRPORT (53128)
CHANDLER, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1243 ft. above sea level
Latitude: 33.268
Longitude: -111.812
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0547	0	FEW220	15.00		64	18.0	49	9.6	34	1.0	33	14	160		28.29			M	AA		29.60
08	0647	0	FEW220	40.00		66	19.0	51	10.5	36	2.0	33	16	150		28.27			M	AA		29.58
08	0747	0	FEW200	40.00		70	21.0	53	11.5	36	2.0	29	17	160		28.29			M	AA		29.60
08	0847	0	FEW200	7.00	BLDU	73	23.0	54	12.4	37	3.0	27	25	170	32	28.25			M	AA		29.56
08	0947	0	FEW180	10.00		75	24.0	56	13.2	39	4.0	27	29	180	40	28.22			M	AA		29.53
08	1047	0	FEW120	5.00	BLDU	79	26.0	57	14.1	39	4.0	24	32	190	44	28.22			M	AA		29.53
08	1147	0	FEW030	8.00	BLDU	81	27.0	57	13.9	36	2.0	20	34	180	46	28.17			M	AA		29.48
08	1247	0	FEW030	10.00	BLDU	82	28.0	57	13.7	34	1.0	18	29	200	40	28.16			M	AA		29.46
08	1347	0	FEW060	5.00	BLDU	81	27.0	55	12.9	30	-1.0	16	25	200	36	28.13			M	AA		29.43
08	1447	0	BKN060	4.00	BLDU	81	27.0	57	13.9	36	2.0	20	26	210	40	28.10			M	AA		29.40
08	1547	0	BKN060	4.00	BLDU	79	26.0	56	13.1	34	1.0	20	34	200	48	28.11			M	AA		29.41
08	1614	0	BKN060	1.50	BLDU	79	26.0	56	13.1	34	1.0	20	32	230	48	28.10			M	AA		29.40
08	1650	0	SCT030 BKN060	2.00	BLDU	79	26.0	56	13.1	34	1.0	20	32	230	44	28.10			M	AA		29.40
08	1750	0	BKN060	2.00	BLDU	75	24.0	52	11.2	28	-2.0	18	29	230	44	28.09			M	AA		29.39
08	1810	0	BKN060	4.00	BLDU	73	23.0	52	11.0	30	-1.0	20	32	230	40	28.09			M	AA		29.39
08	1850	0	BKN060	5.00	BLDU	73	23.0	52	11.0	30	-1.0	20	25	230	32	28.10			M	AA		29.40
08	1947	0	BKN060	8.00		63	17.0	50	10.0	37	3.0	38	23	300	40	28.15			M	AA		29.45
08	2047	0	OVC050	10.00	-RA	55	13.0	50	9.9	45	7.0	69	25	300	40	28.22			M	AA		29.53

Figure A-77. Quality-controlled local climatological data hourly observations table for Chandler Municipal Airport, Chandler, AZ (04/08/2013). Note in the Weather Type column that BLDU (blowing dust) was reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
CHANDLER MUNICIPAL AIRPORT (53128)
CHANDLER, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1243 ft. above sea level
Latitude: 33.268
Longitude: -111.812
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0547	0	OVC070	15.00		54	12.0	48	8.6	41	5.0	62	17	190		28.35			M	AA		29.66
09	0647	0	BKN060 BKN090	20.00		54	12.0	48	8.6	41	5.0	62	15	180		28.37			M	AA		29.68
09	0747	0	SCT060 BKN100	15.00		55	13.0	47	8.4	39	4.0	55	17	200		28.39			M	AA		29.70
09	0847	0	SCT080 BKN120	15.00		57	14.0	47	8.5	37	3.0	47	15	190		28.40			M	AA		29.72
09	0947	0	SCT060 BKN100	25.00		63	17.0	48	8.6	30	-1.0	29	14	230	22	28.43			M	AA		29.74
09	1047	0	SCT080 BKN120	25.00		63	17.0	48	8.6	30	-1.0	29	11	260	17	28.44			M	AA		29.76
09	1147	0	SCT080 BKN120 BKN200	30.00		66	19.0	48	9.0	28	-2.0	24	10	250		28.44			M	AA		29.76
09	1247	0	SCT090 BKN120	30.00		68	20.0	49	9.5	28	-2.0	22	15	230	21	28.43			M	AA		29.75
09	1347	0	BKN080 BKN150	30.00		70	21.0	50	9.9	27	-3.0	20	20	260	26	28.43			M	AA		29.74
09	1447	0	SCT080 BKN120	30.00		70	21.0	49	9.6	25	-4.0	18	11	280	23	28.42			M	AA		29.73
09	1547	0	SCT080 BKN180	30.00		70	21.0	49	9.3	23	-5.0	17	15	270	23	28.43			M	AA		29.74
09	1650	0	BKN120 BKN200	30.00		70	21.0	49	9.3	23	-5.0	17	11	200		28.43			M	AA		29.75
09	1750	0	BKN120 BKN200	30.00		70	21.0	48	9.0	21	-6.0	16	11	260		28.43			M	AA		29.74
09	1850	0	BKN120 BKN200	30.00		70	21.0	49	9.6	25	-4.0	18	9	250		28.43			M	AA		29.75
09	1947	0	BKN120	15.00		66	19.0	48	8.9	27	-3.0	23	11	250		28.44			M	AA		29.76
09	2047	0	BKN120	15.00		68	20.0	48	8.8	23	-5.0	18	22	290	30	28.48			M	AA		29.80

Figure A-78. Quality-controlled local climatological data hourly observations table for Chandler Municipal Airport, Chandler, AZ (04/09/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
NAF (23199)
EL CENTRO, CA (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: -42 ft. below sea level
Latitude: 32.816
Longitude: -115.683
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0056	5	CLR	10.00		70	21.1	56	13.3	44	6.7	39	28	250	37	29.67	6	011	29.67	AA		29.63
08	0156	5	CLR	10.00		67	19.4	56	13.1	46	7.8	47	28	250	34	29.66			29.67	AA		29.62
08	0256	5	CLR	10.00		64	17.8	54	12.4	46	7.8	52	24	230	33	29.63			29.64	AA		29.59
08	0356	5	CLR	10.00		66	18.9	54	11.9	42	5.6	42	17	240	28	29.61	8	019	29.62	AA		29.57
08	0456	5	CLR	10.00		65	18.3	54	11.9	43	6.1	45	37	260	43	29.63			29.63	AA		29.59
08	0556	5	CLR	10.00		65	18.3	55	12.7	46	7.8	50	23	240	32	29.65			29.66	AA		29.61
08	0656	5	CLR	7.00		66	18.9	55	12.7	45	7.2	47	33	230	40	29.65	0	011	29.65	AA		29.61
08	0708	5	CLR	1.75	BLDU	66	19.0	55	12.6	45	7.0	47	37	230	43	29.62			M	SP		29.58
08	0724	5	CLR	3.00	BLDU	66	19.0	54	12.2	43	6.0	43	30	230	39	29.61			M	SP		29.57
08	0754	5	CLR	2.50	BLDU	68	20.0	55	12.6	43	6.0	41	33	230	45	29.62			M	SP		29.58
08	0756	5	CLR	2.00	BLDU	68	20.0	55	12.6	43	6.1	41	33	230	45	29.61			29.62	AA		29.57
08	0803	5	CLR	1.25	BLDU	68	20.0	55	12.6	43	6.0	41	32	230	45	29.62			M	SP		29.58
08	0812	5	CLR	3.00	BLDU	68	20.0	55	12.6	43	6.0	41	33	230	41	29.63			M	SP		29.59
08	0856	5	CLR	3.00	BLDU	71	21.7	55	12.9	41	5.0	34	29	240	37	29.61			29.61	AA		29.57
08	0956	5	CLR	10.00		75	23.9	55	12.8	36	2.2	24	18	240		29.60	6	014	29.61	AA		29.56
08	1054	5	CLR	2.50	BLDU	73	23.0	55	12.5	37	3.0	27	38	240	47	29.59			M	SP		29.55
08	1056	5	CLR	2.50	BLDU	73	22.8	55	12.5	37	2.8	27	33	240	47	29.60			29.60	AA		29.56
08	1110	5	CLR	4.00	BLDU	73	23.0	55	12.5	37	3.0	27	39	240	48	29.59			M	SP		29.55
08	1126	5	CLR	2.00	BLDU	73	23.0	55	12.9	39	4.0	29	39	240	51	29.58			M	SP		29.54
08	1133	5	CLR	1.25	BLDU	73	23.0	55	12.9	39	4.0	29	45	240	53	29.59			M	SP		29.55
08	1144	5	CLR	0.75	BLDU	72	22.0	55	12.7	39	4.0	30	44	250	55	29.58			M	SP		29.54
08	1156	5	CLR	1.00	BLDU	72	22.2	55	12.7	39	3.9	30	43	250	54	29.58			29.58	AA		29.54
08	1203	5	OVC012	1.50	BLDU	72	22.0	54	12.3	37	3.0	28	46	250	56	29.58			M	SP		29.54
08	1227	5	VV010	0.50s	BLDUs	72	22.0	54	12.3	37	3.0	28	46	240	58	29.58			M	SP		29.54
08	1239	5	VV009	0.50s	BLDUs	70	21.0	53	11.6	36	2.0	29	46	250	56	29.58			M	SP		29.54
08	1256	5	VV007	0.50s	BLDUs	69	20.6	53	11.6	37	2.8	31	40	250	60	29.59	5	006	29.59	AA		29.55
08	1350	5	VV010	1.00	BLDU	68	20.0	53	11.3	37	3.0	32	44	250	55	29.60			M	SP		29.56
08	1351	5	OVC010	1.25	BLDU	68	20.0	53	11.3	37	2.8	32	44	250	55	29.60			29.60	AA		29.56
08	1439	5	VV009	0.75	BLDU	66	19.0	52	10.9	37	3.0	34	47	250	56	29.62			M	SP		29.58
08	1453	5	VV010	1.00	BLDU	66	19.0	52	10.9	37	3.0	34	48	250	59	29.62			M	SP		29.58
08	1456	5	OVC010	1.25	BLDU	66	18.9	52	10.9	37	2.8	34	44	250	59	29.62			29.62	AA		29.58
08	1543	5	OVC019	2.50	BLDU	64	18.0	51	10.4	37	3.0	37	39	250	56	29.65			M	SP		29.61
08	1556	5	OVC017	2.00	BLDU	65	18.3	51	10.4	36	2.2	34	46	250	54	29.65	3	020	29.65	AA		29.61
08	1605	5	OVC021	1.50	BLDU	64	18.0	50	10.2	36	2.0	36	48	250	59	29.65			M	SP		29.61

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	1627	5	OVC017	2.50	BLDU	63	17.0	50	10.1	37	3.0	38	38	240	55	29.63			M	SP		29.59
08	1644	5	OVC015	4.00	BLDU	63	17.0	51	10.5	39	4.0	41	36	250	52	29.64			M	SP		29.60
08	1656	5	BKN015	6.00	BLDU	62	16.7	50	10.1	38	3.3	41	33	250	46	29.64			29.64	AA		29.60
08	1720	5	FEW015	8.00	BLDU	63	17.0	50	9.9	36	2.0	37	30	260	39	29.63			M	SP		29.59
08	1756	5	FEW060	10.00		62	16.7	49	9.7	36	2.2	38	30	270	36	29.63			29.64	AA		29.59
08	1856	5	FEW060	10.00		60	15.6	49	9.3	37	2.8	43	33	260	40	29.65	5	000	29.65	AA		29.61
08	1956	5	CLR	10.00		60	15.6	49	9.4	37	2.8	43	31	250	38	29.68			29.68	AA		29.64
08	2056	5	CLR	10.00		59	15.0	48	9.1	37	2.8	44	30	250	37	29.70			29.70	AA		29.66
08	2156	5	CLR	10.00		59	15.0	48	9.1	37	2.8	44	26	260		29.71	1	021	29.72	AA		29.67
08	2256	5	CLR	10.00		60	15.6	49	9.4	37	2.8	43	24	250		29.73			29.74	AA		29.69
08	2356	5	CLR	10.00		60	15.6	49	9.4	37	2.8	43	24	260		29.74			29.75	AA		29.70

Figure A-79. Quality-controlled local climatological data hourly observations table for Naval Air Facility, El Centro, CA (04/08/2013). Note in the Weather Type column that BLDU (blowing dust) was reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA HOURLY OBSERVATIONS TABLE NAF (23199) EL CENTRO, CA (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: -42 ft. below sea level
Latitude: 32.816
Longitude: -115.683
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0056	5	CLR	10.00		59	15.0	48	9.1	37	2.8	44	20	260		29.75	1	012	29.75	AA		29.71
09	0156	5	CLR	10.00		58	14.4	48	8.6	36	2.2	44	17	260		29.76			29.76	AA		29.72
09	0256	5	CLR	10.00		58	14.4	48	8.6	36	2.2	44	17	260		29.77			29.77	AA		29.73
09	0356	5	CLR	10.00		57	13.9	47	8.4	36	2.2	46	16	260		29.78	3	012	29.79	AA		29.74
09	0456	5	CLR	10.00		56	13.3	47	8.1	36	2.2	47	16	260		29.81			29.81	AA		29.77
09	0556	5	CLR	10.00		55	12.8	46	7.8	36	2.2	49	10	280		29.83			29.84	AA		29.79
09	0656	5	CLR	10.00		61	16.1	49	9.2	35	1.7	38	8	250		29.85	1	023	29.85	AA		29.81
09	0756	5	CLR	10.00		67	19.4	49	9.7	29	-1.7	24	17	280		29.87			29.88	AA		29.83
09	0856	5	CLR	10.00		70	21.1	49	9.4	22	-5.6	16	20	300	32	29.88			29.88	AA		29.84
09	0956	5	CLR	10.00		73	22.8	50	9.9	20	-6.7	13	22	310	30	29.89	1	013	29.89	AA		29.85
09	1056	5	CLR	10.00		74	23.3	50	10.0	19	-7.2	12	15	340	24	29.88			29.88	AA		29.84
09	1156	5	CLR	10.00		75	23.9	50	10.0	17	-8.3	11	14	330	29	29.87			29.88	AA		29.83
09	1256	5	CLR	10.00		77	25.0	51	10.5	17	-8.3	10	16	330	26	29.86	8	009	29.86	AA		29.82
09	1356	5	CLR	10.00		79	26.1	52	10.9	16	-8.9	9	15	310	21	29.84			29.85	AA		29.80
09	1456	5	FEW060	10.00		79	26.1	52	10.8	15	-9.4	9	11	330	22	29.83			29.83	AA		29.79
09	1556	5	FEW060	10.00		79	26.1	51	10.7	14	-10.0	8	13	300	24	29.82	6	014	29.82	AA		29.78
09	1656	5	FEW060	10.00		79	26.1	51	10.6	13	-10.6	8	14	300	20	29.82			29.82	AA		29.78
09	1756	5	CLR	10.00		73	22.8	51	10.5	25	-3.9	17	8	250		29.83			29.83	AA		29.79
09	1856	5	CLR	10.00		67	19.4	53	11.5	39	3.9	36	10	230		29.86	3	013	29.86	AA		29.82
09	1956	5	CLR	10.00		66	18.9	51	10.5	35	1.7	32	10	240		29.89			29.89	AA		29.85
09	2056	5	CLR	10.00		65	18.3	50	10.0	34	1.1	32	10	240		29.92			29.92	AA		29.88
09	2156	5	CLR	10.00		62	16.7	49	9.5	35	1.7	37	10	230		29.93	1	024	29.93	AA		29.89
09	2256	5	CLR	10.00		59	15.0	47	8.1	32	0.0	36	8	260		29.95			29.96	AA		29.91
09	2356	5	CLR	10.00		63	17.2	46	8.0	25	-3.9	24	10	350		29.98			29.98	AA		29.94

Figure A-80. Quality-controlled local climatological data hourly observations table for Naval Air Facility, El Centro, CA (04/09/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
GLENDALE MUNICIPAL AIRPORT (53126)
GLENDALE, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1066 ft. above sea level
Latitude: 33.527
Longitude: -112.295
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0547	0	FEW200	20.00		63	17.0	52	10.9	41	5.0	45	3	VR		28.46			M	AA		29.59
08	0647	0	FEW200	20.00		63	17.0	52	10.9	41	5.0	45	5	VR		28.46			M	AA		29.58
08	0747	0	FEW200	20.00		68	20.0	54	12.1	41	5.0	38	3	VR		28.46			M	AA		29.58
08	0847	0	FEW180	20.00		73	23.0	54	12.4	37	3.0	27	9	200		28.43			M	AA		29.56
08	0947	0	FEW180	15.00		75	24.0	M	M	43	6.0	M	15	210	20	M			M	AA		M
08	1047	0	FEW150	10.00	BLDU	77	25.0	57	13.7	39	4.0	26	22	180	37	28.40			M	AA		29.53
08	1150	0	FEW150	6.00	BLDU	79	26.0	57	14.1	39	4.0	24	24	190	41	28.37			M	AA		29.49
08	1247	0	FEW120	2.00	BLDU	79	26.0	57	13.7	37	3.0	22	29	210	39	28.36			M	AA		29.48
08	1347	0	FEW060	5.00	BLDU	79	26.0	57	14.1	39	4.0	24	23	190	34	28.33			M	AA		29.45
08	1447	0	FEW060	5.00	BLDU	81	27.0	57	13.9	36	2.0	20	24	190	36	28.30			M	AA		29.42
08	1647	0	SCT060	5.00	BLDU	79	26.0	56	13.1	34	1.0	20	21	240	31	28.26			M	AA		29.38
08	1747	0	BKN060	8.00		72	22.0	52	11.2	32	0.0	23	16	310		28.29			M	AA		29.41
08	1847	0	BKN060	5.00	-RA	63	17.0	52	10.9	41	5.0	45	24	300	36	28.32			M	AA		29.44
08	1947	0	BKN060	10.00	-RA	61	16.0	51	10.4	41	5.0	48	17	280	25	28.39			M	AA		29.51

Figure A-81. Quality-controlled local climatological data hourly observations table for Glendale Municipal Airport, Glendale, AZ (04/08/2013). Note in the Weather Type column that BLDU (blowing dust) was reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
GLENDALE MUNICIPAL AIRPORT (53126)
GLENDALE, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1066 ft. above sea level
Latitude: 33.527
Longitude: -112.295
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0547	0	BKN060 OVC100	20.00		55	13.0	47	8.4	39	4.0	55	6	170		28.52			M	AA		29.65
09	0647	0	BKN060 OVC120	20.00		57	14.0	47	8.5	37	3.0	47	8	180		28.54			M	AA		29.67
09	0747	0	BKN060 BKN120	20.00		57	14.0	47	8.5	37	3.0	47	11	180		28.57			M	AA		29.70
09	0847	0	SCT060 BKN120	20.00		61	16.0	47	8.5	32	0.0	34	11	180	17	28.59			M	AA		29.72
09	0947	0	SCT100 BKN150	20.00		64	18.0	48	8.9	30	-1.0	28	8	200	17	28.61			M	AA		29.74
09	1047	0	FEW050 SCT100 BKN150	20.00		66	19.0	48	9.1	28	-2.0	24	7	170	17	28.62			M	AA		29.75
09	1147	0	FEW060 SCT085 BKN150	20.00		66	19.0	48	9.1	28	-2.0	24	7	270		28.62			M	AA		29.75
09	1247	0	SCT085 BKN150	20.00		70	21.0	50	9.9	27	-3.0	20	11	240	17	28.61			M	AA		29.74
09	1347	0	SCT080 BKN150	20.00		72	22.0	50	9.8	23	-5.0	16	15	240	23	28.61			M	AA		29.74
09	1450	0	BKN100 BKN250	20.00		73	23.0	50	10.0	23	-5.0	15	13	250	24	28.60			M	AA		29.73
09	1547	0	BKN100 BKN250	20.00		73	23.0	50	10.0	23	-5.0	15	14	260	23	28.60			M	AA		29.73
09	1647	0	BKN100 BKN250	20.00		73	23.0	50	10.0	23	-5.0	15	14	260	18	28.60			M	AA		29.73
09	1747	0	BKN100 BKN250	20.00		73	23.0	51	10.3	25	-4.0	17	11	270	17	28.61			M	AA		29.74
09	1847	0	SCT100 BKN250	20.00		72	22.0	51	10.4	27	-3.0	19	16	280		28.62			M	AA		29.75
09	1947	0	SCT100 BKN250	20.00		70	21.0	49	9.3	23	-5.0	17	20	280	23	28.66			M	AA		29.79

Figure A-82. Quality-controlled local climatological data hourly observations table for Glendale Municipal Airport, Glendale, AZ (04/09/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
PHOENIX GOODYEAR AIRPORT (03186)
GOODYEAR, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 968 ft. above sea level
Latitude: 33.416
Longitude: -112.383
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0547	0	FEW180	10.00		63	17.0	50	10.0	37	3.0	38	5	VR		28.57			M	AA		29.59
08	0647	0	FEW180	10.00		64	18.0	51	10.7	39	4.0	40	6	VR		28.56			M	AA		29.58
08	0747	0	FEW180	10.00		68	20.0	55	12.5	43	6.0	41	6	VR		28.56			M	AA		29.58
08	0847	0	FEW180	10.00		75	24.0	57	13.7	41	5.0	30	9	220	18	28.54			M	AA		29.56
08	0947	0	FEW180	10.00		77	25.0	59	15.2	46	8.0	33	16	220	25	28.51			M	AA		29.53
08	1047	0	FEW100	4.00	BLDU	79	26.0	59	14.9	43	6.0	28	21	230	40	28.51			M	AA		29.53
08	1147	0	FEW060	3.00	BLDU	81	27.0	58	14.5	39	4.0	22	29	220	40	28.47			M	AA		29.49
08	1247	0	FEW060	2.50	BLDU	82	28.0	60	15.6	43	6.0	25	25	240	40	28.44			M	AA		29.46
08	1355	0	FEW060	2.50	BLDU	81	27.0	60	15.3	43	6.0	26	29	240	46	28.40			M	AA		29.42
08	1447	0	BKN040	2.00	BLDU	81	27.0	58	14.5	39	4.0	22	29	230	46	28.38			M	AA		29.40
08	1547	0	BKN050	4.00	-RA BLDU	79	26.0	60	15.4	45	7.0	30	29	230	38	28.37			M	AA		29.39
08	1647	0	BKN050 BKN100	4.00	HZ	81	27.0	57	13.6	34	1.0	18	29	260	38	28.37			M	AA		29.39
08	1747	0	OVC100	5.00	BLDSs	73	23.0	55	12.8	39	4.0	29	16	350		28.38			M	AA		29.40
08	1847	0	SCT070 OVC100	2.00	BLDU	70	21.0	52	11.1	34	1.0	27	23	350	34	28.41			M	AA		29.43
08	1947	0	SCT070 OVC100	7.00	RA	63	17.0	51	10.4	39	4.0	41	21	310	29	28.50			M	AA		29.52
08	2047	0	SCT070 OVC100	7.00	-RA	61	16.0	53	11.6	46	8.0	58	9	050		28.50			M	AA		29.52

Figure A-83. Quality-controlled local climatological data hourly observations table for Phoenix Goodyear Airport, Goodyear, AZ (04/08/2013). Note in the Weather Type column that BLDU (blowing dust) and HZ (haze) were reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
PHOENIX GOODYEAR AIRPORT (03186)
GOODYEAR, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 968 ft. above sea level
Latitude: 33.416
Longitude: -112.383
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0547	0	BKN070 OVC120	10.00		57	14.0	48	8.9	39	4.0	51	13	230		28.63			M	AA		29.65
09	0647	0	BKN100 OVC150	10.00		57	14.0	48	8.9	39	4.0	51	14	220		28.65			M	AA		29.68
09	0747	0	BKN100 BKN150	10.00		57	14.0	47	8.3	36	2.0	46	14	220	18	28.67			M	AA		29.70
09	0847	0	BKN100 BKN150	10.00		61	16.0	48	8.9	34	1.0	36	14	220		28.70			M	AA		29.73
09	0947	0	BKN100 BKN150	10.00		64	18.0	48	8.6	28	-2.0	26	16	240		28.71			M	AA		29.74
09	1047	0	BKN100 BKN150	10.00		66	19.0	48	9.1	28	-2.0	24	11	260		28.73			M	AA		29.76
09	1147	0	BKN100 BKN150	10.00		70	21.0	50	10.1	28	-2.0	21	9	260		28.72			M	AA		29.75
09	1247	0	BKN100 BKN180	10.00		72	22.0	51	10.6	28	-2.0	19	13	240	21	28.71			M	AA		29.74
09	1347	0	BKN100 BKN200	10.00		73	23.0	51	10.6	27	-3.0	18	11	220	21	28.71			M	AA		29.74
09	1447	0	BKN100 BKN200	10.00		73	23.0	51	10.6	27	-3.0	18	14	230	23	28.70			M	AA		29.73
09	1547	0	BKN100 BKN200	10.00		75	24.0	52	11.1	27	-3.0	17	14	240	21	28.69			M	AA		29.72
09	1647	0	BKN100 BKN200	10.00		73	23.0	51	10.3	25	-4.0	17	14	220	21	28.70			M	AA		29.73
09	1747	0	BKN100 BKN200	10.00		73	23.0	51	10.6	27	-3.0	18	14	230		28.71			M	AA		29.74
09	1847	0	SCT100 BKN200	10.00		72	22.0	51	10.4	27	-3.0	19	14	290		28.73			M	AA		29.76
09	1947	0	SCT100 BKN200	10.00		70	21.0	49	9.6	25	-4.0	18	14	330	23	28.76			M	AA		29.79
09	2047	0	SCT100 BKN200	10.00		66	19.0	48	8.6	25	-4.0	21	14	310		28.81			M	AA		29.84

Figure A-84. Quality-controlled local climatological data hourly observations table for Phoenix Goodyear Airport, Goodyear, AZ (04/09/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
IMPERIAL COUNTY AIRPORT (03144)
IMPERIAL, CA (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: -58 ft. below sea level
Latitude: 32.834
Longitude: -115.578
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0053	12	CLR	10.00		68	20.0	56	13.1	45	7.2	44	17	260	25	29.68	6	013	29.62	AA		29.62
08	0153	12	CLR	10.00		66	18.9	55	12.9	46	7.8	49	20	260	30	29.67			29.61	AA		29.61
08	0253	12	CLR	10.00		65	18.3	55	12.7	46	7.8	50	25	240	32	29.64			29.58	AA		29.58
08	0353	12	CLR	10.00		63	17.2	54	11.9	45	7.2	52	11	230		29.63	7	016	29.57	AA		29.57
08	0453	12	CLR	10.00		65	18.3	54	11.9	43	6.1	45	25	250	34	29.59			29.53	AA		29.53
08	0538	12	FEW008	3.00	HZ	63	17.0	54	12.2	46	8.0	54	33	250	46	29.63			M	SP		29.57
08	0553	12	CLR	8.00		64	17.8	55	12.7	47	8.3	54	25	260	39	29.63			29.57	AA		29.57
08	0653	12	CLR	8.00		66	18.9	56	13.1	47	8.3	51	31	250	39	29.64	3	003	29.58	AA		29.58
08	0753	12	BKN015	3.00	HZ	67	19.4	55	12.9	45	7.2	45	32	250	44	29.61			29.54	AA		29.55
08	0806	12	BKN015	1.75	HZ	68	20.0	56	13.1	45	7.0	44	37	240	48	29.59			M	SP		29.54
08	0811	12	VV013	1.00	HZ	68	20.0	56	13.1	45	7.0	44	34	250	48	29.59			M	SP		29.53
08	0822	12	BKN013	2.00	HZ	68	20.0	56	13.1	45	7.0	44	34	250	51	29.59			M	SP		29.54
08	0853	12	OVC013	2.00	HZ	70	21.1	56	13.1	43	6.1	38	31	240	38	29.61			29.54	AA		29.55
08	0908	12	BKN015	3.00	HZ	72	22.0	57	13.6	43	6.0	35	30	240	43	29.61			M	SP		29.55
08	0934	12	SCT024	5.00	HZ	72	22.0	57	13.6	43	6.0	35	31	240	39	29.61			M	SP		29.55
08	0945	12	BKN020	4.00	HZ	73	23.0	57	13.8	43	6.0	34	23	240	36	29.62			M	SP		29.56
08	0951	12	SCT018	5.00	HZ	73	23.0	56	13.3	41	5.0	32	28	240	33	29.61			M	SP		29.55
08	0953	12	SCT018	5.00	HZ	73	22.8	56	13.1	40	4.4	30	28	240	33	29.62	5	007	29.55	AA		29.56
08	1001	12	BKN018	3.00	HZ	73	23.0	55	12.9	39	4.0	29	22	230	34	29.61			M	SP		29.55
08	1023	12	SCT023	6.00	HZ	73	23.0	55	12.9	39	4.0	29	26	240	40	29.61			M	SP		29.55
08	1051	12	BKN026 BKN033 BKN040	5.00	HZ	73	23.0	55	12.9	39	4.0	29	31	240	41	29.59			M	SP		29.53
08	1053	12	BKN026 BKN033 OVC040	4.00	HZ	74	23.3	56	13.2	39	3.9	28	29	250	41	29.59			29.53	AA		29.53
08	1103	12	BKN030 OVC037	2.50	HZ	73	23.0	55	12.5	37	3.0	27	36	250	44	29.58			M	SP		29.52
08	1115	12	BKN030 BKN037 OVC050	4.00	HZ	73	23.0	55	12.9	39	4.0	29	30	250	45	29.58			M	SP		29.52
08	1124	12	BKN026 BKN030 OVC038	2.50	HZ	73	23.0	56	13.3	41	5.0	32	33	250	46	29.58			M	SP		29.52
08	1141	12	BKN018 OVC026	1.50	HZ	72	22.0	56	13.6	43	6.0	35	37	250	48	29.58			M	SP		29.52
08	1148	12	BKN018 OVC024	1.25	HZ	72	22.0	56	13.6	43	6.0	35	33	260	47	29.58			M	SP		29.52
08	1153	12	BKN016 OVC024	1.25	HZ	71	21.7	55	12.9	41	5.0	34	37	250	47	29.58			29.52	AA		29.52
08	1209	12	OVC016	1.50	HZ	72	22.0	55	12.7	39	4.0	30	38	260	47	29.58			M	SP		29.52
08	1211	12	OVC014	1.25	HZ	72	22.0	55	12.7	39	4.0	30	40	250	49	29.58			M	SP		29.52
08	1250	12	VV012	0.75	HZ	70	21.0	54	12.2	39	4.0	32	40	260	49	29.59			M	SP		29.53
08	1253	12	VV011	0.75	HZ	68	20.0	53	11.8	39	3.9	35	33	260	49	29.59	0	003	29.52	AA		29.53
08	1316	12	VV011	1.00	HZ	68	20.0	53	11.8	39	4.0	35	39	260	48	29.59			M	SP		29.53
08	1333	12	VV011	0.75	HZ	68	20.0	53	11.3	37	3.0	32	37	260	49	29.58			M	SP		29.52

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	1343	12	VV012	1.00	HZ	68	20.0	53	11.8	39	4.0	35	36	260	49	29.58			M	SP		29.52
08	1353	12	VV011	1.00	HZ	67	19.4	53	11.5	39	3.9	36	38	260	47	29.58			29.51	AA		29.52
08	1407	12	OVC012	1.50	HZ	68	20.0	53	11.8	39	4.0	35	34	260	47	29.58			M	SP		29.52
08	1414	12	VV011	1.00	HZ	66	19.0	52	11.3	39	4.0	37	36	260	51	29.58			M	SP		29.52
08	1437	12	OVC011	1.50	HZ	66	19.0	52	11.3	39	4.0	37	33	260	49	29.59			M	SP		29.53
08	1444	12	VV011	1.00	HZ	66	19.0	52	11.3	39	4.0	37	43	260	55	29.58			M	SP		29.52
08	1451	12	VV011	0.75	HZ	66	19.0	52	11.3	39	4.0	37	41	260	55	29.58			M	SP		29.52
08	1453	12	VV011	0.75	HZ	66	18.9	52	11.3	39	3.9	37	33	260	52	29.59			29.53	AA		29.53
08	1500	12	VV010	1.00	HZ	64	18.0	52	10.8	39	4.0	40	32	260	54	29.59			M	SP		29.54
08	1525	12	OVC013	1.75	HZ	64	18.0	52	10.8	39	4.0	40	36	260	53	29.61			M	SP		29.55
08	1533	12	OVC013	2.50	HZ	64	18.0	51	10.4	37	3.0	37	37	260	54	29.61			M	SP		29.55
08	1540	12	OVC015	2.00	HZ	64	18.0	51	10.4	37	3.0	37	39	260	54	29.59			M	SP		29.54
08	1551	12	OVC021	3.00	HZ	64	18.0	52	10.8	39	4.0	40	37	250	55	29.62			M	SP		29.56
08	1553	12	OVC021	3.00	HZ	64	17.8	52	10.8	39	3.9	40	41	250	55	29.62	3	011	29.56	AA		29.56
08	1651	12	SCT017	7.00		61	16.0	50	10.0	39	4.0	44	32	250	44	29.65			M	SP		29.59
08	1653	12	SCT017	8.00		61	16.1	50	10.0	39	3.9	44	29	250	44	29.65			29.58	AA		29.59
08	1753	12	CLR	10.00		60	15.6	49	9.6	38	3.3	44	25	250	37	29.63			29.57	AA		29.57
08	1853	12	CLR	10.00		59	15.0	49	9.5	39	3.9	48	22	260	31	29.65	1	010	29.59	AA		29.59
08	1953	12	CLR	10.00		59	15.0	49	9.5	39	3.9	48	24	260	32	29.67			29.61	AA		29.61
08	2053	12	CLR	10.00		58	14.4	49	9.5	40	4.4	51	21	260	32	29.70			29.64	AA		29.64
08	2153	12	CLR	10.00		58	14.4	49	9.3	39	3.9	49	20	260		29.71	1	023	29.65	AA		29.65
08	2253	12	CLR	10.00		58	14.4	49	9.3	39	3.9	49	22	270	29	29.73			29.67	AA		29.67
08	2353	12	CLR	10.00		57	13.9	48	8.8	38	3.3	49	13	270		29.76			29.70	AA		29.70

Figure A-85. Quality-controlled local climatological data hourly observations table for Imperial County Airport, Imperial, CA (04/08/2013). Note in the Weather Type column that HZ (haze) was reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
IMPERIAL COUNTY AIRPORT (03144)
IMPERIAL, CA (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: -58 ft. below sea level
Latitude: 32.834
Longitude: -115.578
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0053	12	CLR	10.00		58	14.4	48	9.1	38	3.3	48	17	270		29.76	0	014	29.70	AA		29.70
09	0153	12	CLR	10.00		57	13.9	48	8.8	38	3.3	49	16	270	23	29.76			29.69	AA		29.70
09	0253	12	CLR	10.00		56	13.3	47	8.5	38	3.3	51	11	280		29.77	3	011	29.71	AA		29.71
09	0353	12	CLR	10.00		55	12.8	47	8.3	38	3.3	53	13	270		29.79			29.73	AA		29.73
09	0453	12	CLR	10.00		54	12.2	46	7.8	37	2.8	53	11	270		29.82			29.75	AA		29.76
09	0553	12	CLR	10.00		53	11.7	46	7.7	38	3.3	57	10	270		29.84	1	024	29.78	AA		29.78
09	0653	12	CLR	10.00		59	15.0	49	9.5	39	3.9	48	9	270		29.86			29.80	AA		29.80
09	0753	12	CLR	10.00		66	18.9	50	9.9	32	0.0	28	11	300	23	29.88			29.82	AA		29.82
09	0853	12	CLR	10.00		69	20.6	49	9.5	25	-3.9	19	15	310	31	29.88	1	012	29.82	AA		29.82
09	0953	12	CLR	10.00		71	21.7	49	9.5	21	-6.1	15	16	320	31	29.89			29.83	AA		29.83
09	1053	12	CLR	10.00		74	23.3	50	10.0	19	-7.2	12	21	350	24	29.89			29.83	AA		29.83
09	1153	12	CLR	10.00		75	23.9	51	10.3	19	-7.2	12	16	350	22	29.88	8	007	29.82	AA		29.82
09	1253	12	CLR	10.00		76	24.4	51	10.5	19	-7.2	12	13	350	18	29.87			29.81	AA		29.81
09	1353	12	CLR	10.00		78	25.6	51	10.8	17	-8.3	10	14	360	22	29.86			29.80	AA		29.80
09	1453	12	CLR	10.00		79	26.1	52	10.8	15	-9.4	9	11	340	20	29.85	8	014	29.78	AA		29.79
09	1553	12	CLR	10.00		79	26.1	52	10.9	16	-8.9	9	11	330		29.83			29.77	AA		29.77
09	1653	12	CLR	10.00		77	25.0	52	11.0	21	-6.1	12	7	300		29.83			29.77	AA		29.77
09	1753	12	CLR	10.00		71	21.7	51	10.6	29	-1.7	21	8	250		29.85	3	013	29.78	AA		29.79
09	1853	12	CLR	10.00		68	20.0	52	11.0	35	1.7	30	10	240		29.87			29.81	AA		29.81
09	1953	12	CLR	10.00		65	18.3	52	10.8	38	3.3	37	10	240		29.90			29.84	AA		29.84
09	2053	12	CLR	10.00		61	16.1	50	9.8	38	3.3	43	7	250		29.93	1	024	29.87	AA		29.87
09	2153	12	CLR	10.00		61	16.1	49	9.4	36	2.2	39	10	240		29.94			29.88	AA		29.88
09	2253	12	CLR	10.00		57	13.9	47	8.4	36	2.2	46	10	260		29.96			29.90	AA		29.90
09	2353	12	CLR	10.00		61	16.1	47	8.3	30	-1.1	31	0	000		30.00			29.93	AA		29.94

Figure A-86. Quality-controlled local climatological data hourly observations table for Imperial County Airport, Imperial, CA (04/09/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
LUKE AFB AIRPORT (23111)
GLENDALE, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1085 ft. above sea level
Latitude: 33.55
Longitude: -112.366
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0058	0	CLR	10.00		73	22.7	55	13.0	40	4.5	30	10	200		28.51			29.62	AA		29.66
08	0158	0	CLR	10.00		70	21.2	55	12.5	41	4.8	35	11	220		28.49	8	015	29.60	AA		29.64
08	0258	0	CLR	10.00		69	20.8	54	12.1	40	4.2	35	2	180		28.48			29.59	AA		29.63
08	0358	0	CLR	10.00		67	19.2	53	11.6	40	4.2	37	3	110		28.46			29.58	AA		29.61
08	0458	0	CLR	10.00		67	19.6	52	11.2	38	3.5	35	2	150		28.44	7	017	29.55	AA		29.59
08	0558	0	CLR	10.00		65	18.6	51	10.5	37	2.6	36	6	190		28.41			29.53	AA		29.56
08	0658	0	CLR	10.00		65	18.2	51	10.7	38	3.2	37	0	000		28.43			29.54	AA		29.57
08	0758	0	CLR	10.00		68	20.0	53	11.6	39	3.8	35	3	VR		28.40	5	012	29.52	AA		29.55
08	0858	0	CLR	10.00		72	22.1	55	12.8	40	4.4	31	13	210	18	28.40			29.51	AA		29.54
08	0958	0	FEW006	2.00	BLDU	76	24.2	57	14.1	42	5.5	30	25	210	31	28.38			29.49	AA		29.52
08	1008	0	SCT005	5.00	HZ	75	24.0	57	14.1	43	6.0	32	25	210	34	28.38			M	AA		29.52
08	1024	0	FEW004	6.00	HZ	75	24.0	57	14.1	43	6.0	32	29	190	36	28.36			M	AA		29.50
08	1034	0	CLR	5.00	HZ	77	25.0	58	14.5	43	6.0	30	29	200	39	28.35			M	AA		29.49
08	1046	0	FEW004	0.50s	BLDUs	77	25.0	58	14.5	43	6.0	30	29	220	38	28.36			M	AA		29.50
08	1058	0	SCT004	1.00	BLDU	77	25.2	58	14.3	42	5.7	29	33	210	39	28.36	7	017	29.47	AA		29.50
08	1158	0	FEW005	1.00	BLDU	78	25.7	58	14.5	42	5.7	28	32	220	44	28.32			29.43	AA		29.46
08	1217	0	FEW004	3.00	HZ	79	26.0	57	14.1	39	4.0	24	34	230	45	28.31			M	AA		29.45
08	1258	0	FEW004 SCT200	2.00	BLDU	78	25.8	58	14.3	41	5.1	27	33	220	40	28.30			29.41	AA		29.44
08	1308	0	FEW004	2.50	BLDU	79	26.0	58	14.5	41	5.0	26	31	240	40	28.30			M	AA		29.44
08	1348	0	CLR	10.00		79	26.0	59	14.9	43	6.0	28	26	240	38	28.29			M	AA		29.43
08	1358	0	CLR	2.50		80	26.6	60	15.3	44	6.4	28	33	230	41	28.28	7	027	29.39	AA		29.42
08	1408	0	CLR	2.50		81	27.0	60	15.3	43	6.0	26	30	220	39	28.28			M	AA		29.42
08	1458	0	FEW005	2.00		79	26.1	59	14.7	42	5.6	27	31	210	40	28.25			29.36	AA		29.39
08	1508	0	CLR	7.00		79	26.0	59	14.9	43	6.0	28	31	200	40	28.24			M	AA	T	29.38
08	1558	0	FEW009	10.00	-RA	74	23.1	60	15.6	50	9.8	43	17	230	36	28.24			29.35	AA	T	29.38
08	1649	0	CLR	10.00		77	25.0	56	13.2	37	3.0	24	17	310	22	28.24			M	AA	T	29.38
08	1658	0	BKN110	10.00		73	23.0	57	14.1	45	7.0	37	14	310		28.25	5	010	29.36	AA	T	29.39
08	1758	0	FEW100	10.00		69	20.8	52	11.2	36	2.4	30	16	320	21	28.25			29.36	AA		29.39
08	1828	0	BKN100	10.00	-RA	68	20.0	50	10.2	32	0.0	26	25	330	31	28.28			M	AA	T	29.42
08	1858	0	BKN100	10.00	-RA	62	16.8	53	11.6	45	7.2	54	25	310	31	28.30			29.42	AA	T	29.44
08	1958	0	CLR	10.00	-DZ	61	16.1	50	9.7	38	3.4	43	17	290	22	28.36	3	036	29.48	AA	T	29.50
08	2039	0	FEW014	10.00		59	15.0	52	10.9	45	7.0	60	6	320		28.35			M	AA	0.01	29.49
08	2044	0	FEW014	10.00	-DZ	59	15.0	51	10.4	43	6.0	56	3	330		28.35			M	AA	0.01	29.49
08	2058	0	CLR	10.00	-DZ	60	15.7	48	8.8	35	1.5	39	13	290	20	28.36			29.48	AA	0.01	29.50
08	2102	0	CLR	10.00	-DZ	61	16.0	49	9.3	36	2.0	39	11	330	26	28.36			M	AA	T	29.50

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	2103	0	CLR	10.00		61	16.0	49	9.5	37	3.0	41	10	330	26	28.36			M	AA	T	29.50
08	2158	0	CLR	10.00		60	15.8	51	10.4	42	5.5	52	7	140		28.35			29.47	AA	T	29.49
08	2258	0	FEW100	10.00		59	14.8	51	10.6	44	6.7	58	10	220		28.37	3	002	29.49	AA		29.51
08	2358	0	CLR	10.00		60	15.6	50	9.9	40	4.6	48	10	230		28.39			29.50	AA		29.53

Figure A-87. Quality-controlled local climatological data hourly observations table for Luke Air Force Base Airport, Glendale, AZ (04/08/2013). Note in the Weather Type column that BLDU (blowing dust) and HZ (haze) were reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
LUKE AFB AIRPORT (23111)
GLENDALE, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1085 ft. above sea level
Latitude: 33.55
Longitude: -112.366
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0038	0	BKN080	10.00		59	15.0	51	10.4	43	6.0	56	5	220		28.40			M	AA		29.54
09	0058	0	BKN070	10.00		59	14.8	50	10.1	42	5.7	54	9	250		28.40			29.52	AA		29.55
09	0126	0	BKN075	10.00	-RA	59	15.0	48	9.0	37	3.0	44	16	290		28.40			M	AA	T	29.55
09	0138	0	BKN075	10.00		59	15.0	48	9.0	37	3.0	44	18	270		28.40			M	AA	T	29.55
09	0143	0	SCT075	10.00	-DZ	59	15.0	48	9.0	37	3.0	44	15	270		28.41			M	AA	T	29.56
09	0158	0	FEW075	10.00	-DZ	59	14.9	49	9.4	39	4.0	48	18	290	24	28.41	2	017	29.53	AA	T	29.56
09	0201	0	FEW070	10.00		59	15.0	49	9.4	39	4.0	48	16	290	24	28.41			M	AA	T	29.56
09	0219	0	CLR	10.00	-DZ	59	15.0	49	9.4	39	4.0	48	24	300		28.41			M	AA	T	29.56
09	0258	0	CLR	10.00	-RA	56	13.2	49	9.6	43	5.9	62	14	280		28.44			29.57	AA	T	29.59
09	0314	0	CLR	10.00		57	14.0	49	9.4	41	5.0	55	10	290		28.44			M	AA	T	29.59
09	0358	0	SCT095	10.00		56	13.1	49	9.4	42	5.8	60	5	270		28.46			29.58	AA	T	29.60
09	0408	0	BKN095	10.00		55	13.0	49	9.4	43	6.0	64	6	290		28.46			M	AA		29.60
09	0428	0	BKN100	10.00		55	13.0	49	9.4	43	6.0	64	5	240		28.46			M	AA		29.60
09	0458	0	FEW070	10.00		56	13.2	49	9.1	41	5.0	57	3	250		28.46	2	017	29.59	AA		29.61
09	0558	0	FEW120	10.00		56	13.6	48	8.7	39	3.9	53	9	200		28.48			29.61	AA		29.63
09	0658	0	BKN100	10.00		56	13.5	47	8.4	38	3.3	51	10	220		28.51			29.65	AA		29.66
09	0758	0	CLR	10.00		58	14.3	47	8.3	35	1.8	42	13	220		28.54	2	024	29.68	AA		29.69
09	0858	0	CLR	10.00		61	15.9	48	8.7	33	0.4	35	9	220		28.56			29.70	AA		29.71
09	0958	0	FEW100	10.00		65	18.6	48	9.0	29	-1.8	26	9	260		28.57			29.70	AA		29.72
09	1058	0	CLR	10.00		67	19.2	49	9.1	27	-2.7	22	2	VR		28.58	2	014	29.71	AA		29.73
09	1158	0	FEW090	10.00		68	20.1	49	9.2	26	-3.3	21	8	290		28.58			29.71	AA		29.73
09	1258	0	FEW100	10.00		71	21.5	50	9.8	25	-3.7	18	11	230	21	28.57			29.70	AA		29.72
09	1304	0	FEW100	10.00		72	22.0	50	10.1	25	-4.0	17	15	250	21	28.57			M	AA		29.72
09	1319	0	FEW180	10.00		72	22.0	50	10.1	25	-4.0	17	14	270	22	28.57			M	AA		29.72
09	1348	0	FEW100	10.00		72	22.0	50	10.1	25	-4.0	17	20	260	26	28.56			M	AA		29.71
09	1358	0	SCT100 SCT130	10.00		71	21.6	50	9.7	24	-4.3	17	14	250	26	28.57	8	003	29.70	AA		29.72
09	1406	0	SCT100	10.00		72	22.0	50	9.8	23	-5.0	16	14	290		28.57			M	AA		29.72
09	1410	0	FEW100	10.00		72	22.0	50	9.8	23	-5.0	16	16	240	23	28.57			M	AA		29.72
09	1458	0	BKN110	10.00		72	22.2	50	9.9	24	-4.6	16	8	260		28.56			29.69	AA		29.71
09	1558	0	BKN110	10.00		72	22.4	50	9.9	24	-4.3	16	10	270		28.56			29.69	AA		29.71
09	1658	0	BKN120	10.00		73	22.5	51	10.3	25	-3.8	17	13	270		28.56	5	002	29.69	AA		29.71
09	1758	0	BKN110	10.00		73	22.5	51	10.5	26	-3.2	17	11	290		28.58			29.71	AA		29.73

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	1858	0	SCT120	10.00		69	20.8	49	9.3	25	-3.7	19	15	290		28.59			29.72	AA		29.74
09	1958	0	FEW150	10.00		67	19.4	48	8.8	25	-3.7	20	16	320		28.64	2	025	29.77	AA		29.79
09	2058	0	CLR	10.00		63	17.3	47	8.1	27	-2.6	26	6	330		28.68			29.81	AA		29.83
09	2158	0	CLR	10.00		60	15.8	46	7.5	28	-2.5	30	8	320		28.71			29.84	AA		29.86
09	2258	0	CLR	10.00		58	14.3	45	7.0	28	-2.5	32	7	310		28.72	2	027	29.86	AA		29.88
09	2358	0	CLR	10.00		55	12.6	44	6.3	29	-1.8	37	10	350		28.72			29.86	AA		29.88

Figure A-88. Quality-controlled local climatological data hourly observations table for Luke Air Force Base Airport, Glendale, AZ (04/09/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA HOURLY OBSERVATIONS TABLE FALCON FIELD AIRPORT (03185) MESA, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1380 ft. above sea level
Latitude: 33.466
Longitude: -111.733
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0948	0	CLR	10.00		72	22.0	54	12.1	37	3.0	28	23	180	29	28.09			M	AA		29.55
08	1047	0	CLR	7.00		77	25.0	56	13.2	37	3.0	24	23	180		28.07			M	AA		29.53
08	1147	0	SCT100	10.00		79	26.0	56	13.4	36	2.0	21	17	180		28.03			M	AA		29.49
08	1247	0	FEW100	20.00		81	27.0	56	13.2	32	0.0	17	23	220	37	27.99			M	AA		29.45
08	1351	0	FEW100	10.00		79	26.0	54	12.1	28	-2.0	15	29	240	40	27.95			M	AA		29.41
08	1447	0	SCT100	10.00		81	27.0	57	13.9	36	2.0	20	17	250	29	27.94			M	AA		29.40
08	1552	0	SCT100	10.00		77	25.0	54	12.3	32	0.0	19	25	190	40	27.93			M	AA		29.39
08	1647	0	SCT100	10.00		77	25.0	55	13.0	36	2.0	23	17	210	29	27.93			M	AA		29.39
08	1751	0	SCT100	8.00		73	23.0	53	11.7	34	1.0	24	23	210	32	27.92			M	AA		29.38
08	1951	0	SCT100 OVC240	10.00		61	16.0	50	9.9	39	4.0	44	13	280		28.00			M	AA		29.46

Figure A-89. Quality-controlled local climatological data hourly observations table for Falcon Field Airport, Mesa, AZ (04/08/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA HOURLY OBSERVATIONS TABLE FALCON FIELD AIRPORT (03185) MESA, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1380 ft. above sea level
Latitude: 33.466
Longitude: -111.733
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0550	0	OVC060	30.00		54	12.0	47	8.1	39	4.0	57	7	210		28.18			M	AA		29.65
09	0747	0	OVC060	20.00		54	12.0	45	7.4	36	2.0	51	11	170		28.23			M	AA		29.70
09	1047	0	SCT060 BKN080	40.00		61	16.0	47	8.1	30	-1.0	31	10	270		28.28			M	AA		29.75
09	1147	0	SCT060 BKN080	40.00		64	18.0	47	8.5	28	-2.0	26	14	270		28.28			M	AA		29.75
09	1255	0	BKN080 BKN150	40.00		66	19.0	48	8.9	27	-3.0	23	14	240		28.27			M	AA		29.74
09	1347	0	BKN100 BKN150	40.00		68	20.0	48	9.0	25	-4.0	20	16	240		28.27			M	AA		29.74
09	1447	0	BKN100 BKN150	40.00		70	21.0	49	9.5	25	-4.0	18	14	270	21	28.26			M	AA		29.73
09	1547	0	BKN100 BKN150	40.00		68	20.0	48	8.7	23	-5.0	18	14	240		28.27			M	AA		29.74
09	1647	0	BKN100 BKN150	40.00		68	20.0	47	8.5	21	-6.0	17	17	220		28.27			M	AA		29.74
09	1748	0	BKN100 BKN150	40.00		66	19.0	46	7.9	21	-6.0	18	11	230		28.27			M	AA		29.74
09	1851	0	BKN100 BKN150	40.00		63	17.0	45	7.4	23	-5.0	22	11	230		28.27			M	AA		29.74

Figure A-90. Quality-controlled local climatological data hourly observations table for Falcon Field Airport, Mesa, AZ (04/09/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
WILLIAMS GATEWAY AIRPORT (23104)
PHOENIX, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1382 ft. above sea level
Latitude: 33.3
Longitude: -111.666
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0015	0	CLR	10.00		68	20.0	52	11.0	36	2.0	31	7	240		28.26			M	AA		29.72
08	0035	0	CLR	10.00		66	19.0	51	10.5	36	2.0	33	3	220		28.25			M	AA		29.71
08	0055	0	CLR	10.00		64	18.0	49	9.6	34	1.0	33	3	350		28.25			M	AA		29.70
08	0115	0	CLR	10.00		68	20.0	52	11.0	36	2.0	31	0	000		28.25			M	AA		29.70
08	0135	0	CLR	10.00		64	18.0	49	9.6	34	1.0	33	0	000		28.25			M	AA		29.70
08	0155	0	CLR	10.00		63	17.0	48	9.0	32	0.0	31	6	110		28.23			M	AA		29.69
08	0215	0	CLR	10.00		63	17.0	48	9.0	32	0.0	31	7	100		28.23			M	AA		29.69
08	0235	0	CLR	10.00		63	17.0	49	9.4	34	1.0	34	9	120		28.22			M	AA		29.68
08	0255	0	CLR	10.00		61	16.0	48	8.9	34	1.0	36	7	120		28.22			M	AA		29.67
08	0315	0	CLR	10.00		61	16.0	48	8.9	34	1.0	36	8	110		28.21			M	AA		29.66
08	0335	0	CLR	10.00		61	16.0	49	9.3	36	2.0	39	9	110		28.21			M	AA		29.66
08	0355	0	CLR	10.00		63	17.0	50	9.8	36	2.0	37	7	100		28.20			M	AA		29.65
08	0415	0	CLR	10.00		61	16.0	48	8.9	34	1.0	36	8	100		28.20			M	AA		29.65
08	0435	0	CLR	10.00		61	16.0	48	8.9	34	1.0	36	9	120		28.19			M	AA		29.64
08	0455	0	CLR	10.00		59	15.0	48	9.0	37	3.0	44	8	130		28.19			M	AA		29.64
08	0515	0	CLR	10.00		59	15.0	48	9.0	37	3.0	44	9	150		28.18			M	AA		29.63
08	0547	0	FEW080	20.00		61	16.0	49	9.5	37	3.0	41	10	130		28.18			M	AA		29.63
08	0647	0	FEW080	30.00		61	16.0	49	9.5	37	3.0	41	11	120		28.17			M	AA		29.62
08	0747	0	FEW080	30.00		64	18.0	50	10.2	37	3.0	37	9	120		28.17			M	AA		29.62
08	0847	0	FEW080	10.00		73	23.0	54	12.3	37	3.0	27	16	170	23	28.14			M	AA		29.59
08	0947	0	FEW080	3.00	BLDU	75	24.0	55	12.8	37	3.0	25	31	200	40	28.11			M	AA		29.56
08	1047	0	FEW080	5.00	BLDU	79	26.0	57	13.7	37	3.0	22	25	200	34	28.11			M	AA		29.56
08	1147	0	SCT080	5.00	BLDU	81	27.0	57	14.1	37	3.0	21	26	220	37	28.07			M	AA		29.52
08	1247	0	SCT	7.00		81	27.0	M	M	32	0.0	M	26	230	33	M			M	AA		29.50
08	1250	0	FEW070 SCT100	7.00	BLDU	81	27.0	56	13.2	32	0.0	17	26	230	33	28.05			M	AA		29.50
08	1349	0	FEW070 SCT100	7.00	BLDU	84	29.0	58	14.1	34	1.0	17	26	220	33	28.00			M	AA		29.45
08	1447	0	SCT070 SCT100	4.00	DU	82	28.0	57	14.1	36	2.0	19	24	220	39	27.98			M	AA		29.42
08	1547	0	SCT080	2.00	DU	81	27.0	55	12.8	30	-1.0	16	34	240	41	27.99			M	AA		29.43
08	1647	0	SCT080	3.00	DU	79	26.0	55	12.7	32	0.0	18	28	240	36	27.96			M	AA		29.41
08	1747	0	SCT080	3.00	DU	75	24.0	52	11.0	27	-3.0	17	25	220	39	27.98			M	AA		29.42
08	1847	0	SCT065	4.00	HZ	73	23.0	51	10.7	28	-2.0	19	24	240	32	27.98			M	AA		29.42
08	1955	0	SCT085 OVC110	7.00		63	17.0	50	9.8	36	2.0	37	25	310	36	28.02			M	AA		29.47
08	2015	0	BKN080 OVC110	7.00		61	16.0	50	9.9	39	4.0	44	20	310	28	28.05			M	AA	0.02	29.50
08	2035	0	OVC080	10.00	-RA	61	16.0	51	10.4	41	5.0	48	29	300	36	28.08			M	AA	0.02	29.53

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	2055	0	SCT049 BKN060 OVC070	7.00	+RA	55	13.0	50	9.9	45	7.0	69	22	310	37	28.12			M	AA	0.02	29.57
08	2115	0	SCT034 OVC049	7.00	VCTSRA	54	12.0	49	9.6	45	7.0	72	13	310		28.12			M	AA	0.10	29.57
08	2135	0	OVC049	7.00	RA	55	13.0	49	9.3	43	6.0	64	20	330		28.14			M	AA	0.10	29.59
08	2155	0	SCT035 OVC049	7.00	RA	52	11.0	48	8.6	43	6.0	72	14	310		28.14			M	AA	0.10	29.59
08	2215	0	SCT045 OVC060	10.00	RA	52	11.0	48	8.6	43	6.0	72	6	090		28.13			M	AA		29.58
08	2235	0	SCT060 OVC080	10.00		52	11.0	48	9.1	45	7.0	77	8	110		28.12			M	AA		29.57
08	2255	0	SCT080 BKN095 BKN120	10.00		52	11.0	49	9.3	46	8.0	80	9	120		28.12			M	AA		29.57
08	2315	0	BKN110	10.00		52	11.0	49	9.3	46	8.0	80	10	120		28.12			M	AA		29.57
08	2335	0	SCT065 BKN085 OVC110	10.00		52	11.0	49	9.3	46	8.0	80	10	140		28.13			M	AA		29.58
08	2355	0	BKN055 OVC085	10.00	-DZ	52	11.0	49	9.4	46	8.0	80	9	150		28.15			M	AA		29.60

Figure A-91. Quality-controlled local climatological data hourly observations table for Williams Gateway Airport, Phoenix, AZ (04/08/2013). Note in the Weather Type column that BLDU (blowing dust), DU (widespread dust), and HZ (haze) were reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
WILLIAMS GATEWAY AIRPORT (23104)
PHOENIX, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1382 ft. above sea level
Latitude: 33.3
Longitude: -111.666
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0015	0	SCT055 BKN070 OVC090	10.00		52	11.0	49	9.4	46	8.0	80	11	150		28.15			M	AA		29.60
09	0035	0	SCT055 BKN080 OVC095	10.00		52	11.0	49	9.4	46	8.0	80	11	150		28.16			M	AA		29.61
09	0115	0	SCT055 OVC085	10.00		52	11.0	49	9.4	46	8.0	80	13	130		28.16			M	AA		29.61
09	0135	0	BKN075 OVC100	10.00		52	11.0	50	9.9	48	9.0	86	11	120		28.16			M	AA		29.61
09	0155	0	BKN075 OVC100	10.00		52	11.0	51	10.5	50	10.0	93	10	140		28.16			M	AA		29.61
09	0215	0	BKN075 OVC080	10.00		52	11.0	50	9.9	48	9.0	86	14	140		28.16			M	AA		29.61
09	0235	0	BKN070 OVC100	10.00		52	11.0	50	9.9	48	9.0	86	11	160		28.16			M	AA		29.61
09	0255	0	BKN070 BKN080 OVC100	10.00		52	11.0	49	9.4	46	8.0	80	10	150		28.16			M	AA		29.61
09	0315	0	BKN060 OVC070	10.00		52	11.0	49	9.4	46	8.0	80	7	160		28.16			M	AA		29.61
09	0335	0	SCT060 SCT070 OVC095	10.00		52	11.0	47	8.1	41	5.0	66	16	250	22	28.16			M	AA		29.61
09	0355	0	SCT050 SCT065 OVC095	10.00		54	12.0	48	9.1	43	6.0	67	20	270	24	28.18			M	AA		29.63
09	0415	0	SCT070 OVC085	10.00		54	12.0	48	9.1	43	6.0	67	13	290		28.18			M	AA		29.63
09	0435	0	BKN070 OVC085	10.00		54	12.0	48	9.1	43	6.0	67	11	250		28.19			M	AA		29.64
09	0455	0	OVC060	10.00		52	11.0	48	8.6	43	6.0	72	7	230		28.20			M	AA		29.65
09	0515	0	OVC060	10.00		52	11.0	48	8.6	43	6.0	72	9	230		28.21			M	AA		29.66
09	0657	0	OVC075	15.00		54	12.0	48	8.6	41	5.0	62	14	220		28.25			M	AA		29.70
09	0747	0	SCT065 OVC090	15.00		55	13.0	48	8.9	41	5.0	59	8	210		28.26			M	AA		29.72
09	0847	0	SCT065 SCT090 BKN120	15.00		57	14.0	49	9.4	41	5.0	55	15	230	20	28.29			M	AA		29.75
09	0947	0	SCT065 SCT090 BKN120	15.00		59	15.0	48	8.8	36	2.0	42	8	220	14s	28.30			M	AA		29.76
09	1047	0	SCT085 BKN110	20.00		61	16.0	47	8.5	32	0.0	34	6	270		28.31			M	AA		29.77
09	1247	0	BKN095 BKN120	30.00		66	19.0	48	9.0	28	-2.0	24	10	210		28.31			M	AA		29.77
09	1347	0	BKN095 BKN120	30.00		66	19.0	48	8.9	27	-3.0	23	8	230		28.31			M	AA		29.77
09	1450	0	BKN100 BKN150	30.00		68	20.0	53	11.6	39	4.0	35	9	280		28.30			M	AA		29.76
09	1547	0	BKN100 BKN150	30.00		70	21.0	49	9.5	25	-4.0	18	9	240	23	28.30			M	AA		29.76
09	1647	0	SCT070 BKN100 BKN150	45.00		70	21.0	49	9.2	23	-5.0	17	18	240		28.30			M	AA		29.76
09	1747	0	SCT070 BKN100 BKN200	45.00		68	20.0	48	8.7	23	-5.0	18	8	250		28.31			M	AA		29.77
09	1847	0	SCT070 BKN120 BKN200	20.00		66	19.0	48	8.9	27	-3.0	23	6	220		28.31			M	AA		29.77
09	1947	0	BKN	20.00		64	18.0	M	M	32	0.0	M	5	210		M			M	AA		29.78
09	1955	0	SCT120	10.00		63	17.0	48	9.0	32	0.0	31	6	250		28.33			M	AA		29.79
09	2015	0	BKN110	10.00		64	18.0	48	8.9	30	-1.0	28	8	250		28.34			M	AA		29.80
09	2035	0	BKN100 OVC120	10.00		63	17.0	48	9.0	32	0.0	31	16	350	24	28.36			M	AA		29.82
09	2047	0	BKN	20.00		63	17.0	M	M	34	1.0	M	13	340	21	M			M	AA		29.83
09	2055	0	BKN110	10.00		63	17.0	48	9.0	32	0.0	31	17	360	23	28.37			M	AA		29.83
09	2115	0	BKN100	10.00		63	17.0	48	9.0	32	0.0	31	14	350		28.39			M	AA		29.85

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	2135	0	OVC100	10.00		63	17.0	48	8.6	30	-1.0	29	13	350		28.40			M	AA		29.86
09	2155	0	BKN090 BKN110	10.00		63	17.0	48	8.6	30	-1.0	29	13	340		28.41			M	AA		29.87
09	2215	0	SCT110	10.00		63	17.0	48	8.6	30	-1.0	29	16	340	21	28.41			M	AA		29.87
09	2235	0	CLR	10.00		63	17.0	46	7.5	23	-5.0	22	15	350		28.41			M	AA		29.87
09	2255	0	CLR	10.00		61	16.0	45	6.9	23	-5.0	23	9	340		28.42			M	AA		29.88
09	2315	0	CLR	10.00		61	16.0	45	6.9	23	-5.0	23	9	330		28.42			M	AA		29.88
09	2335	0	CLR	10.00		57	14.0	44	6.5	27	-3.0	32	7	320		28.43			M	AA		29.89
09	2355	0	CLR	10.00		57	14.0	44	6.7	28	-2.0	33	9	310		28.44			M	AA		29.90

Figure A-92. Quality-controlled local climatological data hourly observations table for Williams Gateway Airport, Phoenix, AZ (04/09/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
NOGALES INTERNATIONAL ARPT (03196)
NOGALES, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 3932 ft. above sea level
Latitude: 31.420
Longitude: -110.845
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0054	12	CLR	10.00		57	13.9	44	6.6	29	-1.7	34	3	110		25.84			29.69	AA		29.85
08	0154	12	CLR	10.00		56	13.3	44	6.5	30	-1.1	37	3	090		25.83	8	009	29.67	AA		29.84
08	0254	12	CLR	10.00		56	13.3	44	6.7	31	-0.6	39	5	140		25.81			29.64	AA		29.81
08	0354	12	CLR	10.00		55	12.8	44	6.9	33	0.6	43	3	130		25.81			29.64	AA		29.81
08	0454	12	CLR	10.00		55	12.8	45	7.3	35	1.7	47	7	160		25.79	6	017	29.62	AA		29.79
08	0554	12	CLR	10.00		58	14.4	47	8.1	35	1.7	42	11	170		25.79			29.62	AA		29.79
08	0654	12	CLR	10.00		59	15.0	47	8.6	36	2.2	42	16	170		25.78			29.62	AA		29.78
08	0754	12	CLR	10.00		63	17.2	49	9.5	36	2.2	37	16	170	24	25.78	5	002	29.62	AA		29.78
08	0854	12	CLR	10.00		67	19.4	51	10.3	35	1.7	31	23	180	31	25.78			29.62	AA		29.78
08	0954	12	CLR	10.00		69	20.6	51	10.5	34	1.1	28	21	190	32	25.76			29.60	AA		29.76
08	1054	12	CLR	10.00		72	22.2	52	11.0	33	0.6	24	25	170	31	25.76	8	007	29.59	AA		29.76
08	1154	12	CLR	10.00		74	23.3	53	11.4	33	0.6	22	18	200	36	25.73			29.56	AA		29.72
08	1254	12	CLR	10.00		75	23.9	53	11.9	34	1.1	22	31	210	41	25.70			29.53	AA		29.69
08	1354	12	CLR	10.00		74	23.3	54	12.0	36	2.2	25	31	190	39	25.69	6	024	29.52	AA		29.68
08	1454	12	CLR	10.00		75	23.9	53	11.7	33	0.6	22	32	210	40	25.66			29.48	AA		29.64
08	1554	12	CLR	10.00		72	22.2	52	11.2	34	1.1	25	28	200	39	25.64			29.46	AA		29.62
08	1654	12	CLR	10.00		70	21.1	51	10.3	32	0.0	25	36	180	44	25.62	6	024	29.45	AA		29.60
08	1754	12	CLR	10.00		67	19.4	48	8.7	27	-2.8	22	33	190	47	25.58			29.41	AA		29.56
08	1854	12	FEW041	10.00		63	17.2	48	8.9	33	0.6	33	32	200	44	25.58			29.41	AA		29.55
08	1954	12	CLR	10.00		61	16.1	46	7.6	29	-1.7	30	24	180	44	25.58	5	014	29.40	AA		29.55
08	2054	12	CLR	10.00		59	15.0	45	6.9	28	-2.2	31	21	180	29	25.61			29.44	AA		29.59
08	2154	12	BKN055	10.00		57	13.9	45	7.2	32	0.0	39	28	190	36	25.61			29.44	AA		29.59
08	2254	12	BKN060	10.00		55	12.8	45	7.1	34	1.1	45	31	200	41	25.62	1	015	29.44	AA		29.60
08	2354	12	OVC043	10.00		51	10.6	43	6.0	34	1.1	52	23	240	38	25.69			29.53	AA		29.68

Figure A-93. Quality-controlled local climatological data hourly observations table for Nogales International Airport, Nogales, AZ (04/08/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

HOURLY OBSERVATIONS TABLE
NOGALES INTERNATIONAL ARPT (03196)
NOGALES, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 3932 ft. above sea level

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0054	12	BKN070 OVC085	10.00		51	10.6	43	6.3	35	1.7	54	11	230		25.71			29.55	AA	T	29.70
09	0154	12	OVC049	7.00		48	8.9	43	6.1	38	3.3	68	10	240		25.71	1	031	29.56	AA		29.70
09	0254	12	M	5.00	HZ	47	8.3	42	5.4	36	2.2	66	11	200		25.72			29.57	AA		29.71
09	0354	12	OVC033	5.00	HZ	46	7.8	41	5.1	36	2.2	68	5	180		25.73			29.59	AA		29.72
09	0432	12	FEW026 OVC031	5.00	HZ	46	7.8	41	5.1	36	2.2	68	8	190		25.74			M	SP		29.73
09	0454	12	OVC030	5.00	HZ	45	7.2	40	4.6	35	1.7	68	6	160		25.74			29.61	AA		29.74
09	0504	12	OVC029	5.00	HZ	45	7.2	40	4.4	34	1.1	65	10	150		25.74			M	SP		29.74
09	0514	12	OVC030	5.00	HZ	45	7.2	40	4.4	34	1.1	65	8	160		25.75			M	SP		29.75
09	0536	12	OVC028	4.00	HZ	45	7.2	39	3.9	32	0.0	60	8	200		25.75			M	SP		29.75
09	0554	12	SCT027 OVC075	4.00	HZ	45	7.2	39	3.9	32	0.0	60	8	210		25.76			29.65	AA		29.76
09	0614	12	BKN029 OVC075	2.50	HZ	45	7.2	39	3.7	31	-0.6	58	9	220		25.77			M	SP		29.77
09	0652	12	SCT030 OVC075	2.50	HZ	46	8.0	39	3.8	30	-1.0	54	3	210		25.79			M	SP		29.79
09	0654	12	SCT030 OVC075	2.50	HZ	46	7.8	39	4.0	31	-0.6	56	5	220		25.79			29.67	AA		29.79
09	0711	12	BKN027 OVC075	3.00	HZ	47	8.3	40	4.5	32	0.0	56	8	210		25.79			M	SP		29.79
09	0735	12	OVC026	3.00	HZ	47	8.3	40	4.3	31	-0.6	54	10	180		25.79			M	SP		29.79
09	0754	12	OVC025	4.00	HZ	47	8.3	40	4.3	31	-0.6	54	9	200		25.80	1	013	29.69	AA		29.80
09	0812	12	SCT025 OVC065	5.00	HZ	48	8.9	40	4.3	30	-1.1	50	10	210		25.81			M	SP		29.81
09	0854	12	FEW030 OVC070	6.00	HZ	50	10.0	41	4.9	30	-1.1	46	9	220		25.82			29.71	AA		29.82
09	0925	12	FEW025 OVC070	8.00		53	11.7	42	5.5	29	-1.7	40	11	220	18	25.82			M	SP		29.82
09	0954	12	SCT026 SCT033 OVC070	9.00		53	11.7	42	5.7	30	-1.1	41	14	220	17	25.82			29.72	AA		29.83
09	1054	12	SCT037 BKN050 OVC090	10.00		51	10.6	40	4.2	25	-3.9	36	3	VR		25.83	1	011	29.74	AA		29.84
09	1154	12	BKN060 BKN075	10.00		57	13.9	43	5.9	25	-3.9	29	16	250	30	25.82			29.72	AA		29.82
09	1254	12	FEW065 SCT080 BKN095	10.00		60	15.6	43	6.2	22	-5.6	23	13	320	25	25.81			29.70	AA		29.81
09	1354	12	FEW055 BKN085 OVC100	10.00		55	12.8	40	4.7	21	-6.1	27	17	230	33	25.82	5	003	29.73	AA		29.83
09	1454	12	FEW065 BKN080	10.00		55	12.8	44	6.9	33	0.6	43	16	170	25	25.82			29.74	AA		29.83
09	1554	12	FEW065 BKN090	10.00		59	15.0	47	8.1	34	1.1	39	17	200	25	25.82			29.73	AA		29.83
09	1654	12	BKN090	10.00		58	14.4	43	6.3	26	-3.3	29	11	220	21	25.82	1	002	29.74	AA		29.83
09	1754	12	BKN095	10.00		58	14.4	41	5.0	18	-7.8	21	8	240		25.84			29.75	AA		29.85
09	1854	12	FEW090	10.00		54	12.2	43	6.2	31	-0.6	42	3	VR		25.84			29.76	AA		29.85
09	1954	12	CLR	10.00		49	9.4	42	5.3	33	0.6	54	6	160		25.87	3	015	29.80	AA		29.88
09	2054	12	CLR	10.00		48	8.9	41	5.0	33	0.6	56	7	160		25.89			29.83	AA		29.91
09	2154	12	CLR	10.00		46	7.8	40	4.2	32	0.0	58	7	190		25.92			29.85	AA		29.94
09	2254	12	CLR	10.00		46	7.8	40	4.2	32	0.0	58	7	150		25.93	1	021	29.87	AA		29.95
09	2354	12	CLR	10.00		46	7.8	39	3.8	30	-1.1	54	3	120		25.94			29.86	AA		29.96

Figure A-94. Quality-controlled local climatological data hourly observations table for Nogales International Airport, Nogales, AZ (04/09/2013). Note in the Weather Type column that HZ (haze) was reported, coincident with low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
PHOENIX DEER VALLEY ARPT (03184)
PHOENIX, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1455 ft. above sea level
Latitude: 33.688
Longitude: -112.081

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0053	12	CLR	10.00		70	21.1	54	12.1	39	3.9	32	7	200		28.13			29.62	AA		29.68
08	0153	12	CLR	10.00		69	20.6	54	12.1	40	4.4	35	6	180		28.11	8	009	29.60	AA		29.66
08	0253	12	CLR	10.00		66	19.0	M	M	39	4.0	M	0	000		M			29.57	AUTO		29.64
08	0353	12	CLR	10.00		66	18.9	52	11.1	39	3.9	37	0	000		28.07			29.56	AA		29.62
08	0453	12	CLR	10.00		65	18.3	52	10.9	39	3.9	39	8	130		28.05	6	019	29.54	AA		29.60
08	0553	12	CLR	10.00		63	17.2	51	10.4	39	3.9	41	10	090		28.03			29.52	AA		29.58
08	0653	12	CLR	10.00		64	17.8	50	10.2	37	2.8	37	9	140		28.03			29.52	AA		29.58
08	0753	12	CLR	10.00		67	19.4	52	10.9	37	2.8	33	11	130		28.01	6	014	29.50	AA		29.56
08	0853	12	CLR	10.00		72	22.2	54	12.1	37	2.8	28	15	170	22	27.99			29.47	AA		29.54
08	0937	12	CLR	10.00	BLDU	73	23.0	54	12.3	37	3.0	27	15	180	24	27.99			M	SP		29.54
08	0953	12	CLR	10.00	BLDU	75	23.9	55	13.0	38	3.3	26	16	210	22	27.98			29.47	AA		29.53
08	1053	12	SCT028	7.00	BLDU	77	25.0	56	13.4	38	3.3	25	29	220	38	27.94	8	023	29.43	AA		29.49
08	1153	12	FEW040	10.00	BLDU	77	25.0	57	13.6	39	3.9	26	26	230	38	27.93			29.41	AA		29.47
08	1244	12	BKN029 OVC036	8.00	BLDU	79	26.0	57	13.6	37	3.0	22	32	230	41	27.92			M	SP		29.46
08	1253	12	BKN029 OVC038	7.00	BLDU	77	25.0	56	13.4	38	3.3	25	31	240	41	27.92			29.39	AA		29.46
08	1311	12	OVC031	4.00	HZ BLDU	77	25.0	56	13.2	37	3.0	24	29	240	41	27.91			M	SP		29.45
08	1327	12	BKN031 OVC036	2.50	HZ BLDU	77	25.0	57	13.6	39	4.0	26	24	230	34	27.90			M	SP		29.44
08	1353	12	BKN033 OVC043	5.00	HZ BLDU	78	25.6	57	13.8	39	3.9	25	29	230	39	27.89	8	021	29.36	AA		29.43
08	1453	12	BKN033	3.00	HZ BLDU	75	23.9	56	13.2	39	3.9	27	29	230	36	27.86			29.34	AA		29.40
08	1553	12	BKN033	3.00	HZ BLDU	74	23.3	56	13.4	41	5.0	31	24	220	36	27.84			29.33	AA		29.38
08	1642	12	BKN080 BKN090 OVC110	10.00	-RA BLDU	66	19.0	57	13.8	50	10.0	57	14	300	25	27.86			M	SP		29.40
08	1653	12	FEW031 OVC085	10.00	-RA BLDU	64	17.8	55	12.8	48	8.9	56	18	320	29	27.86	5	009	29.35	AA	0.03	29.40
08	1753	12	OVC100	10.00	BLDUs	67	19.4	53	11.8	41	5.0	39	7s	310		27.87			29.36	AA	T	29.41
08	1853	12	OVC080	10.00	-RA BLDU	63	17.2	50	9.7	36	2.2	37	25	320	37	27.90			29.39	AA	T	29.44
08	1953	12	OVC075	10.00		61	16.1	48	9.0	35	1.7	38	13	300		27.94	3	030	29.44	AA	T	29.49
08	2053	12	BKN060 OVC075	10.00	-RA BLDU	57	13.9	47	8.4	37	2.8	47	15	290	28	27.96			29.47	AA	0.01	29.51
08	2153	12	SCT090 BKN110	10.00	BLDUs	56	13.3	48	8.9	40	4.4	55	3s	140		27.96			29.45	AA	T	29.50
08	2253	12	BKN100 OVC120	10.00	BLDUs	56	13.3	48	9.1	41	5.0	57	9s	110		27.96	1	007	29.46	AA		29.51
08	2353	12	BKN080 OVC100	10.00	BLDU	55	12.8	48	8.8	41	5.0	59	14	130		27.98			29.48	AA		29.53

Figure A-95. Quality-controlled local climatological data hourly observations table for Phoenix Deer Valley Airport, Phoenix, AZ (04/08/2013). Note in the Weather Type column that BLDU (blowing dust) and HZ (haze) were reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
PHOENIX DEER VALLEY ARPT (03184)
PHOENIX, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1455 ft. above sea level
Latitude: 33.688
Longitude: -112.081

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0053	12	OVC070	10.00	BLDU	53	11.7	48	8.8	43	6.1	69	14	140	22	27.99			29.50	AA	T	29.54
09	0153	12	OVC060	10.00	-RAs	52	11.1	49	9.3	46	7.8	80	10s	140		28.00	1	014	29.51	AA	T	29.55
09	0253	12	OVC055	10.00	-RAs	52	11.1	49	9.3	46	7.8	80	7s	170		28.01			29.52	AA	0.01	29.56
09	0353	12	SCT070 OVC095	10.00	BLDUs	53	11.7	48	8.6	42	5.6	66	9s	290		28.03			29.54	AA	T	29.58
09	0453	12	OVC090	10.00	BLDUs	53	11.7	47	8.1	40	4.4	62	9s	300		28.05	3	016	29.57	AA		29.60
09	0553	12	BKN075 OVC090	10.00	BLDUs	53	11.7	47	8.3	41	5.0	64	7s	270		28.08			29.59	AA		29.63
09	0653	12	OVC080	10.00	BLDUs	54	12.2	48	8.6	41	5.0	62	0s	000		28.11			29.62	AA		29.66
09	0753	12	OVC085	10.00		55	12.8	48	8.6	40	4.4	57	5	190		28.13	1	026	29.65	AA		29.68
09	0853	12	BKN110	10.00		57	13.9	47	8.5	37	2.8	47	6	260		28.15			29.67	AA		29.70
09	0953	12	FEW110	10.00		60	15.6	48	8.8	35	1.7	39	10	260		28.17			29.69	AA		29.72
09	1053	12	FEW080 BKN120	10.00		63	17.2	49	9.2	33	0.6	33	7	290		28.17	1	016	29.70	AA		29.73
09	1153	12	BKN080 OVC100	10.00		66	18.9	49	9.2	29	-1.7	25	13	240	17	28.17			29.69	AA		29.73
09	1253	12	SCT095	10.00		68	20.0	49	9.2	26	-3.3	21	16	250	21	28.17			29.68	AA		29.72
09	1308	12	SCT100	10.00		70	21.0	49	9.5	25	-4.0	18	14	260	21	28.17			M	SP		29.72
09	1353	12	OVC095	10.00		68	20.0	48	9.0	25	-3.9	20	15	250	24	28.17	6	005	29.68	AA		29.72
09	1453	12	OVC100	10.00		69	20.6	49	9.1	24	-4.4	18	17	250	21	28.16			29.67	AA		29.71
09	1553	12	BKN100 BKN120	10.00		69	20.6	49	9.1	24	-4.4	18	10	240		28.15			29.65	AA		29.70
09	1653	12	OVC100	10.00		69	20.6	48	9.0	23	-5.0	18	7	290	17	28.17	5	000	29.67	AA		29.72
09	1753	12	OVC110	10.00		69	20.6	48	9.0	23	-5.0	18	17	270	24	28.17			29.68	AA		29.73
09	1853	12	OVC100	10.00		68	20.0	49	9.2	26	-3.3	21	9	340		28.18			29.70	AA		29.74
09	1953	12	OVC110	10.00		65	18.3	49	9.3	31	-0.6	28	11	010	18	28.22	3	022	29.75	AA		29.78
09	2053	12	OVC110	10.00		63	17.2	45	7.0	20	-6.7	19	15	360		28.26			29.79	AA		29.82
09	2153	12	CLR	10.00		61	16.1	44	6.6	21	-6.1	21	11	360		28.29			29.81	AA		29.85
09	2253	12	CLR	10.00		60	15.6	44	6.4	21	-6.1	22	9	360		28.31	1	028	29.83	AA		29.87
09	2353	12	CLR	10.00		58	14.4	43	6.1	23	-5.0	26	10	350		28.33			29.85	AA		29.89

Figure A-96. Quality-controlled local climatological data hourly observations table for Phoenix Deer Valley Airport, Phoenix, AZ (04/09/2013). Note in the Weather Type column that BLDU (blowing dust) was reported. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

HOURLY OBSERVATIONS TABLE
PHOENIX SKY HARBOR INTL AIRPORT (23183)
PHOENIX, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1107 ft. above sea level
Latitude: 33.427
Longitude: -112.003

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0051	11	SCT220 BKN250	10.00		74	23.3	56	13.4	41	5.0	31	5	220		28.50			29.62	AA		29.67
08	0151	11	SCT220 BKN250	10.00		74	23.3	56	13.0	39	3.9	28	0	000		28.48	8	010	29.60	AA		29.65
08	0251	11	SCT220 BKN250	10.00		74	23.3	55	12.6	37	2.8	26	5	VR		28.45			29.57	AA		29.62
08	0351	11	FEW220 BKN250	10.00		69	20.6	53	11.7	38	3.3	32	8	130		28.44			29.56	AA		29.61
08	0451	11	FEW220 BKN250	10.00		68	20.0	53	11.6	39	3.9	35	7	080		28.42	6	017	29.55	AA		29.59
08	0551	11	FEW220 SCT250	10.00		68	20.0	52	10.8	35	1.7	30	5	160		28.41			29.54	AA		29.58
08	0651	11	FEW180	10.00		68	20.0	52	10.8	35	1.7	30	9	130		28.40			29.52	AA		29.57
08	0751	11	FEW100	10.00		72	22.2	54	11.9	36	2.2	27	9	170		28.40	5	009	29.52	AA		29.57
08	0851	11	FEW100	10.00		74	23.3	55	12.8	38	3.3	27	11	160		28.38			29.49	AA		29.54
08	0951	11	CLR	4.00	HZ BLDU	77	25.0	56	13.5	38	3.3	25	21	210		28.35			29.47	AA		29.52
08	1051	11	FEW090	9.00		80	26.7	57	14.1	38	3.3	22	22	210	30	28.34	6	021	29.45	AA		29.50
08	1131	11	FEW100	10.00		82	28.0	58	14.1	36	2.0	19	20	200	31	28.32			M	SP		29.48
08	1151	11	FEW110	10.00		83	28.3	57	13.8	33	0.6	16	17	200	33	28.31			29.41	AA		29.47
08	1251	11	FEW120	9.00		83	28.3	56	13.5	31	-0.6	15	17	230	24	28.29			29.40	AA		29.45
08	1351	11	FEW120	5.00	HZ BLDU	82	27.8	57	13.9	35	1.7	18	25	270	36	28.26	6	027	29.37	AA		29.42
08	1451	11	FEW035 SCT070 SCT100	6.00	HZ BLDU	82	27.8	59	14.7	39	3.9	22	21	260	34	28.23			29.34	AA		29.39
08	1551	11	SCT029 BKN070 BKN100	6.00	HZ BLDU	81	27.2	58	14.5	39	3.9	22	29	230	34	28.22			29.33	AA		29.38
08	1651	11	SCT029 BKN060 BKN090	5.00	HZ BLDU	79	26.1	56	13.5	36	2.2	21	25	220	37	28.20	6	019	29.32	AA		29.36
08	1657	11	BKN029 BKN060 BKN090	4.00	HZ BLDU	79	26.0	56	13.5	36	2.0	21	24	230	36	28.21			M	SP		29.37
08	1702	11	BKN029 OVC060	2.50	HZ BLDU	79	26.0	56	13.5	36	2.0	21	24	230	36	28.21			M	SP		29.37
08	1715	11	BKN032 OVC060	2.00	BLDU	79	26.0	56	13.5	36	2.0	21	18	250	36	28.21			M	SP		29.37
08	1724	11	BKN032 BKN060 OVC090	3.00	BLDU	79	26.0	56	13.5	36	2.0	21	23	240	38	28.21			M	SP		29.37
08	1747	11	SCT034 BKN060 BKN090	10.00		72	22.0	54	12.1	37	3.0	28	20	310	36	28.22			M	SP		29.38
08	1751	11	SCT034 BKN060 BKN090	9.00		72	22.2	54	12.3	38	3.3	29	15	330		28.21			29.33	AA	T	29.37
08	1845	11	SCT050 BKN070CB BKN090	10.00	-TSRA	72	22.0	54	11.9	36	2.0	27	18	320	28	28.24			M	SP		29.40
08	1851	11	SCT050 BKN070CB OVC090	7.00	-TSRA	67	19.4	54	12.3	43	6.1	42	20	300	26	28.25			29.38	AA	0.01	29.41
08	1910	11	SCT050 BKN070 OVC090	10.00	-RA	63	17.0	53	11.8	45	7.0	52	18	320	31	28.26			M	SP		29.42
08	1951	11	SCT050 BKN080 OVC100	10.00	-RA	62	16.7	53	11.4	44	6.7	52	17	300	28	28.30	3	025	29.42	AA	0.04	29.46
08	2051	11	SCT050 BKN080 OVC100	10.00		61	16.1	52	10.9	43	6.1	52	15	300	29	28.34			29.46	AA	0.01	29.50
08	2151	11	SCT060 BKN080 OVC110	10.00	-RA	60	15.6	50	10.1	41	5.0	50	6	250		28.34			29.47	AA	T	29.50
08	2251	11	BKN100	10.00		61	16.1	50	9.9	39	3.9	44	6	130		28.35	1	018	29.47	AA		29.52
08	2351	11	OVC085	10.00		58	14.4	51	10.4	44	6.7	60	14	140		28.38			29.50	AA		29.54

Figure A-97. Quality-controlled local climatological data hourly observations table for Phoenix Sky Harbor International Airport, Phoenix, AZ (04/08/2013). Note in the Weather Type column that HZ (haze) and BLDU (blowing dust) were reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
PHOENIX SKY HARBOR INTL AIRPORT (23183)
PHOENIX, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1107 ft. above sea level
Latitude: 33.427
Longitude: -112.003
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0051	11	SCT060 BKN075 OVC095	10.00		55	12.8	51	10.4	47	8.3	75	15	130	22	28.39			29.52	AA	T	29.56
09	0151	11	OVC075	10.00		57	13.9	51	10.4	45	7.2	64	8	180		28.39	1	015	29.52	AA		29.56
09	0251	11	OVC055	10.00	-RA	59	15.0	49	9.7	40	4.4	50	21	270	25	28.40			29.53	AA	T	29.57
09	0351	11	OVC065	10.00		57	13.9	49	9.6	42	5.6	57	15	300		28.41			29.54	AA	T	29.58
09	0451	11	OVC075	10.00		58	14.4	49	9.2	39	3.9	49	10	280		28.44	3	016	29.57	AA		29.61
09	0551	11	OVC070	10.00		57	13.9	49	9.4	41	5.0	55	5	260		28.47			29.60	AA		29.64
09	0651	11	SCT070 BKN130	10.00		58	14.4	49	9.4	40	4.4	51	3	200		28.49			29.63	AA		29.66
09	0751	11	FEW070 BKN090 BKN120	10.00		59	15.0	49	9.2	38	3.3	46	6	270		28.52	1	025	29.66	AA		29.69
09	0851	11	FEW070 SCT090 SCT120	10.00		62	16.7	48	8.6	31	-0.6	31	13	250		28.54			29.67	AA		29.71
09	0951	11	FEW080 SCT110 BKN200	10.00		64	17.8	47	8.5	28	-2.2	26	13	260	24	28.56			29.70	AA		29.73
09	1051	11	FEW080 BKN110 BKN200	10.00		66	18.9	48	9.1	28	-2.2	24	13	270		28.57	1	017	29.70	AA		29.74
09	1151	11	FEW090 BKN120	10.00		69	20.6	50	9.8	28	-2.2	22	11	210	21	28.57			29.70	AA		29.74
09	1251	11	SCT095 BKN120 BKN250	10.00		71	21.7	50	10.0	26	-3.3	19	14	270	23	28.56			29.70	AA		29.73
09	1351	11	SCT095 BKN120 BKN200	10.00		71	21.7	49	9.5	23	-5.0	16	9	250	24	28.55	8	006	29.69	AA		29.72
09	1451	11	SCT095 BKN120 BKN200	10.00		72	22.2	50	9.8	23	-5.0	16	16	240	29	28.54			29.68	AA		29.71
09	1551	11	SCT095 BKN120 BKN200	10.00		73	22.8	50	9.9	22	-5.6	15	14	260	21	28.55			29.68	AA		29.72
09	1651	11	SCT100 BKN120 BKN200	10.00		72	22.2	49	9.5	21	-6.1	14	14	260	23	28.55	3	001	29.69	AA		29.72
09	1751	11	BKN100 BKN120 BKN200	10.00		72	22.2	49	9.6	22	-5.6	15	17	250	26	28.55			29.69	AA		29.72
09	1851	11	BKN100 BKN120 BKN220	10.00		72	22.2	49	9.6	22	-5.6	15	17	260		28.56			29.70	AA		29.73
09	1951	11	BKN100 BKN120 BKN220	10.00		71	21.7	49	9.3	21	-6.1	15	22	310	28	28.59	3	012	29.72	AA		29.76
09	2036	11	BKN100 BKN120 BKN220	10.00		68	20.0	50	9.9	30	-1.0	24	15	360	24	28.63			M	SP		29.80
09	2051	11	BKN100 BKN120 BKN220	10.00		68	20.0	49	9.6	28	-2.2	22	14	350		28.64			29.78	AA		29.81
09	2151	11	FEW100 SCT120 BKN220	10.00		66	18.9	46	7.7	19	-7.2	16	13	360		28.66			29.81	AA		29.84
09	2251	11	FEW110 SCT250	10.00		65	18.3	46	7.6	20	-6.7	18	13	360		28.69	1	033	29.82	AA		29.86
09	2351	11	FEW110 SCT250	10.00		64	17.8	46	7.5	21	-6.1	19	13	340		28.69			29.83	AA		29.87

Figure A-98. Quality-controlled local climatological data hourly observations table for Phoenix Sky Harbor International Airport, Phoenix, AZ (04/09/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
TUCSON INTERNATIONAL AIRPORT (23160)
TUCSON, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 2549 ft. above sea level
Latitude: 32.131
Longitude: -110.955
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0053	11	CLR	10.00		67	19.4	50	10.0	33	0.6	28	8	190		27.16			29.69	AA		29.81
08	0153	11	CLR	10.00		67	19.4	50	10.2	34	1.1	30	7	180		27.14	8	007	29.66	AA		29.79
08	0253	11	CLR	10.00		65	18.3	50	9.7	34	1.1	32	7	190		27.10			29.63	AA		29.75
08	0353	11	CLR	10.00		63	17.2	48	9.0	33	0.6	33	9	180		27.08			29.61	AA		29.73
08	0453	11	CLR	10.00		63	17.2	48	9.0	33	0.6	33	7	110		27.07	6	019	29.60	AA		29.72
08	0553	11	CLR	10.00		64	17.8	49	9.3	33	0.6	32	6	110		27.07			29.60	AA		29.72
08	0653	11	CLR	10.00		65	18.3	50	10.1	36	2.2	34	6	210		27.07			29.60	AA		29.72
08	0753	11	CLR	10.00		70	21.1	53	11.5	37	2.8	30	14	190	28	27.07	8	002	29.60	AA		29.72
08	0853	11	CLR	10.00		73	22.8	54	12.0	36	2.2	26	21	190	30	27.04			29.56	AA		29.69
08	0953	11	CLR	10.00		76	24.4	55	12.5	35	1.7	23	24	210		27.01			29.53	AA		29.66
08	1051	11	BKN026 BKN035	6.00	HZ	79	26.0	55	12.9	34	1.0	20	22	220	38	27.01			M	SP		29.65
08	1053	11	BKN026 BKN035	6.00	HZ	78	25.6	55	12.7	34	1.1	20	26	210	38	27.01	6	021	29.53	AA		29.65
08	1115	11	BKN014	2.50	HZ	80	26.7	54	12.4	30	-1.1	16	30	210	47	26.98			M	SP		29.62
08	1125	11	BKN012	10.00		81	27.2	55	12.8	31	-0.6	16	25	210	41	26.98			M	SP		29.62
08	1146	11	SCT016	10.00		81	27.2	55	13.0	32	0.0	17	31	200	43	26.97			M	SP		29.61
08	1153	11	SCT020 BKN035	10.00		81	27.2	55	13.0	32	0.0	17	32	210	44	26.96			29.47	AA		29.60
08	1214	11	BKN019	7.00		82	27.8	56	13.2	32	0.0	16	28	200	45	26.95			M	SP		29.59
08	1224	11	SCT022	9.00		82	27.8	56	13.0	31	-0.6	16	32	220	44	26.95			M	SP		29.59
08	1253	11	SCT033	9.00		82	27.8	56	13.4	33	0.6	17	32	210	44	26.94			29.46	AA		29.58
08	1353	11	FEW033	10.00		82	27.8	57	13.9	36	2.2	19	29	200	45	26.93	6	025	29.44	AA		29.57
08	1453	11	SCT028	9.00		83	28.3	54	12.3	25	-3.9	12	31	210	44	26.88			29.39	AA		29.52
08	1553	11	FEW025	10.00		82	27.8	53	11.8	23	-5.0	11	32	200	44	26.84			29.34	AA		29.47
08	1653	11	CLR	10.00		80	26.7	54	12.4	30	-1.1	16	25	220	44	26.84	6	034	29.34	AA		29.47
08	1753	11	SCT020	6.00	HZ	77	25.0	54	12.3	33	0.6	20	25	200	44	26.83			29.34	AA		29.46
08	1808	11	BKN029	9.00		76	24.4	53	11.9	32	0.0	20	20	210	37	26.83			M	SP		29.46
08	1822	11	BKN035	10.00		75	23.9	53	11.6	32	0.0	21	22	200	34	26.82			M	SP		29.45
08	1835	11	BKN023	5.00	HZ	74	23.3	52	11.2	31	-0.6	21	21	210	34	26.83			M	SP		29.46
08	1853	11	BKN025	9.00		73	22.8	52	11.0	31	-0.6	21	23	220	38	26.85			29.36	AA		29.48
08	1900	11	SCT032	10.00		73	22.8	52	11.0	31	-0.6	21	14	240	32	26.85			M	SP		29.48
08	1953	11	SCT085	10.00		71	21.7	52	10.9	33	0.6	25	20	210	29	26.87	3	012	29.39	AA		29.50
08	2053	11	CLR	10.00		67	19.4	47	8.3	23	-5.0	19	21	230	32	26.90			29.41	AA		29.53
08	2153	11	OVC090	10.00		65	18.3	47	8.2	26	-3.3	23	14	260	23	26.94			29.47	AA		29.58
08	2251	11	FEW060 OVC100	9.00		54	12.0s	47	8.1	39	4.0	57	29	340	38	26.98			M	SP		29.62
08	2253	11	SCT060 OVC100	9.00		53	11.7	46	7.8	39	3.9	59	29	330	38	27.00	3	042	29.54	AA		29.64
08	2300	11	SCT060 OVC095	9.00		52	11.1	46	7.8	40	4.4	64	21	300	38	27.01	3	042	29.54	SP		29.65

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	2351	11	SCT009 BKN014 OVC048	5.00	RA BR	48	9.0	47	8.3	46	8.0	93	9	330		27.03			M	SP		29.67
08	2353	11	SCT009 BKN014 OVC045	5.00	-RA BR	49	9.4	47	8.3	45	7.2	86	8	320		27.03			29.58	AA	0.07	29.67

Figure A-99. Quality-controlled local climatological data hourly observations table for Tucson International Airport, Tucson, AZ (04/08/2013). Note in the Weather Type column that HZ (haze) was reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
TUCSON INTERNATIONAL AIRPORT (23160)
TUCSON, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 2549 ft. above sea level

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0009	11	SCT009 BKN037 OVC049	4.00	RA BR	48	8.9	46	8.0	45	7.2	89	7	270		27.03			M	SP		29.68
09	0053	11	BKN044 OVC060	10.00		49	9.4	47	8.3	45	7.2	86	5	230		27.04			29.59	AA	0.03	29.69
09	0153	11	OVC036	10.00		49	9.4	46	7.7	43	6.1	80	3	140		27.03	0	015	29.59	AA	0.02	29.68
09	0253	11	OVC035	10.00		49	9.4	47	8.3	45	7.2	86	8	140		27.04			29.59	AA		29.69
09	0353	11	FEW039 OVC075	8.00		51	10.6	47	8.3	43	6.1	74	3	VR		27.05			29.60	AA		29.70
09	0453	11	FEW035 FEW055 OVC075	6.00	HZ	51	10.6	47	8.5	44	6.7	77	6	260		27.07	3	012	29.62	AA		29.72
09	0514	11	BKN025 OVC075	5.00	HZ	51	10.6	47	8.3	43	6.1	74	0	000		27.08			M	SP		29.73
09	0542	11	BKN022 OVC080	2.50	HZ	50	10.0	45	7.2	40	4.4	69	7	230		27.09			M	SP		29.74
09	0553	11	SCT021 OVC090	2.50	HZ	50	10.0	45	7.2	40	4.4	69	8	210		27.09			29.65	AA		29.74
09	0618	11	SCT018 OVC090	1.50	HZ	50	10.0	45	7.2	40	4.4	69	7	200		27.10			M	SP		29.75
09	0629	11	BKN018 OVC090	1.50	HZ	50	10.0	45	7.2	40	4.4	69	8	210		27.10			M	SP		29.75
09	0653	11	OVC018	1.50	HZ	51	10.6	45	7.0	38	3.3	61	10	210		27.10			29.67	AA		29.75
09	0744	11	OVC016	2.00	HZ	53	11.7	45	7.3	37	2.8	55	10	210		27.13			M	SP		29.78
09	0753	11	OVC017	2.50	HZ	53	11.7	45	7.1	36	2.2	53	13	210		27.13	3	018	29.70	AA		29.78
09	0804	11	OVC018	3.00	HZ	54	12.2	45	7.4	36	2.2	51	17	220		27.13			M	SP		29.78
09	0853	11	OVC024	5.00	HZ	57	13.9	46	7.9	35	1.7	44	11	240	18	27.14			29.72	AA		29.80
09	0953	11	OVC026	10.00		59	15.0	47	8.0	33	0.6	38	17	260	22	27.16			29.73	AA		29.81
09	1037	11	BKN031 BKN065 OVC085	10.00		60	15.6	47	8.1	32	0.0	35	13	230		27.16			M	SP		29.82
09	1053	11	FEW031 SCT075 BKN090	10.00		61	16.1	46	7.8	29	-1.7	30	13	230		27.16	1	014	29.75	AA		29.82
09	1153	11	CLR	10.00		63	17.2	47	8.5	30	-1.1	29	16	250	23	27.16			29.75	AA		29.82
09	1253	11	FEW080 SCT090	10.00		64	17.8	47	8.2	27	-2.8	25	15	260	21	27.16			29.74	AA		29.81
09	1353	11	BKN100	10.00		65	18.3	46	8.0	24	-4.4	21	16	310	25	27.16	6	005	29.74	AA		29.81
09	1453	11	BKN100	10.00		66	18.9	47	8.1	23	-5.0	19	17	290	25	27.16			29.73	AA		29.81
09	1553	11	OVC095	10.00		66	18.9	47	8.1	23	-5.0	19	15	250	22	27.16			29.74	AA		29.81
09	1653	11	BKN095	10.00		66	18.9	46	7.8	21	-6.1	18	10	300	20	27.16	3	004	29.75	AA		29.82
09	1753	11	BKN100	10.00		65	18.3	45	7.4	20	-6.7	18	13	300		27.17			29.76	AA		29.83
09	1853	11	BKN100	10.00		63	17.2	44	6.7	19	-7.2	18	13	280		27.18			29.77	AA		29.84
09	1953	11	BKN100	10.00		62	16.7	44	6.7	21	-6.1	21	7	270		27.20	3	011	29.79	AA		29.86
09	2053	11	CLR	10.00		58	14.4	43	6.3	25	-3.9	28	5	260		27.23			29.81	AA		29.89
09	2153	11	CLR	10.00		56	13.3	43	5.9	26	-3.3	32	5	260		27.24			29.83	AA		29.90
09	2253	11	CLR	10.00		56	13.3	42	5.8	25	-3.9	30	8	260		27.26	1	019	29.85	AA		29.92
09	2353	11	BKN100	10.00		56	13.3	43	6.3	28	-2.2	34	6	310		27.27			29.85	AA		29.93

Figure A-100. Quality-controlled local climatological data hourly observations table for Tucson International Airport, Tucson, AZ (04/09/2013). Note in the Weather Type column that HZ (haze) was reported, coincident with low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

HOURLY OBSERVATIONS TABLE
DAVIS-MONTHAN AFB AIRPORT (23109)
TUCSON, AZ (04/08/2013)

Elevation: 2704 ft. above sea level
Latitude: 32.166
Longitude: -110.883

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0100	0	CLR	10.00		64	18.0	M	M	32	0.0	M	8	180		M	8	007	29.69	AA		29.80
08	0158	0	CLR	10.00		63	17.4	49	9.2	34	1.2	34	8	170		26.97			29.66	AA		29.77
08	0258	0	CLR	10.00		64	17.7	49	9.3	33	0.6	32	7	170		26.94			29.62	AA		29.74
08	0358	0	CLR	10.00		61	16.2	47	8.3	32	0.1	34	6	150		26.92	7	020	29.61	AA		29.72
08	0458	0	CLR	10.00		59	15.2	46	7.8	32	0.0	36	8	130		26.91			29.60	AA		29.71
08	0558	0	CLR	10.00		61	16.3	47	8.5	33	0.6	35	5	150		26.91			29.60	AA		29.71
08	0658	0	CLR	10.00		64	17.8	50	9.7	35	1.6	34	5	170		26.91	4	000	29.60	AA		29.71
08	0758	0	CLR	10.00		68	19.9	52	10.8	36	2.4	31	5	VR		26.91			29.60	AA		29.71
08	0858	0	CLR	10.00		71	21.7	52	11.3	35	1.8	27	20	190	28	26.88			29.56	AA		29.67
08	0958	0	CLR	10.00		74	23.4	54	12.2	36	2.0	25	17	200	25	26.86	7	024	29.54	AA		29.65
08	1058	0	CLR	10.00		77	24.8	55	12.6	35	1.5	22	16	210	33	26.84			29.52	AA		29.63
08	1158	0	CLR	10.00		79	25.9	54	12.4	31	-0.3	17	30	210	40	26.80			29.48	AA	0.08	29.59
08	1258	0	CLR	10.00		80	26.5	55	12.9	33	0.6	18	29	220	43	26.79	7	027	29.46	AA	0.05	29.57
08	1358	0	CLR	10.00		79	26.1	56	13.3	36	2.0	21	31	210	43	26.76			29.43	AA	0.49	29.54
08	1458	0	CLR	10.00		79	26.2	56	13.1	35	1.5	20	24	200	44	26.72			29.39	AA	1.31	29.50
08	1503	0	CLR	9.00	SQ	79	26.0	56	13.3	36	2.0	21	32	190	44	26.72			M	AA	0.55	29.50
08	1558	0	CLR	10.00		80	26.4	54	12.4	30	-1.0	16	30	210	40	26.67	6	029	29.34	AA	0.55	29.45
08	1658	0	CLR	10.00		78	25.6	54	12.3	32	0.1	19	30	210	40	26.67			29.33	AA	0.19	29.44
08	1758	0	CLR	10.00		75	24.0	53	11.8	33	0.8	22	30	210	37	26.67			29.34	AA	0.07	29.44
08	1858	0	CLR	10.00		71	21.8	51	10.5	31	-0.6	23	18	210	31	26.69	3	008	29.37	AA		29.47
08	1958	0	CLR	10.00		69	20.4	51	10.4	33	0.5	26	30	210	45	26.69			29.37	AA		29.47
08	2058	0	CLR	10.00		67	19.2	47	8.4	24	-4.2	20	15	240	32	26.73			29.40	AA	0.05	29.51
08	2158	0	BKN090	10.00		64	17.5	46	8.0	26	-3.1	24	22	260	28	26.77			29.45	AA		29.56
08	2239	0	FEW080	10.00		61	16.0	47	8.3	32	0.0	34	21	280	31	26.79			M	AA		29.57
08	2241	0	FEW095	10.00		61	16.0	47	8.3	32	0.0	34	25	310	32	26.79	2	046	M	AA		29.57
08	2258	0	FEW065	10.00		52	11.0	46	7.5	39	4.0	61	34	310	46	26.83			29.53	AA		29.62
08	2311	0	FEW012 SCT100	10.00	-RA	50	10.0	46	7.5	41	5.0	71	26	310	37	26.86			M	AA	0.11	29.65
08	2316	0	FEW009 SCT016 BKN065	9.00	-RA	48	9.0	45	6.9	41	5.0	77	24	300	37	26.86			M	AA	0.11	29.65
08	2321	0	FEW009 BKN015 BKN060	9.00	-RA	48	9.0	46	7.5	43	6.0	83	21	300	29	26.87			M	AA	0.11	29.66
08	2326	0	SCT015	10.00	-RA	48	9.0	46	8.0	45	7.0	89	20	310		26.86			M	AA	0.11	29.65
08	2336	0	FEW009 BKN015	10.00	-RA	46	8.0	45	7.4	45	7.0	96	20	310		26.86			M	AA	0.11	29.65
08	2346	0	FEW009 BKN023	10.00	+RA	46	8.0	45	7.4	45	7.0	96	11	310		26.87			M	AA	0.11	29.66
08	2358	0	FEW007 OVC022	10.00	RA	47	8.3	46	7.7	45	7.3	93	11	320		26.87			29.58	AA	0.11	29.66

Figure A-101. Quality-controlled local climatological data hourly observations table for Davis-Monthan Air Force Base Airport, Tucson, AZ (04/08/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
DAVIS-MONTHAN AFB AIRPORT (23109)
TUCSON, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 2704 ft. above sea level
Latitude: 32.166
Longitude: -110.883
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp (F)	Dry Bulb Temp (C)	Wet Bulb Temp (F)	Wet Bulb Temp (C)	Dew Point Temp (F)	Dew Point Temp (C)	Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0008	0	FEW007 OVC024	9.00	-RA	46	8.0	45	7.4	45	7.0	96	8	290		26.86			M	AA	0.04	29.65
09	0028	0	BKN026	10.00	-RA	46	8.0	45	7.4	45	7.0	96	2	290		26.88			M	AA	0.04	29.67
09	0033	0	SCT026 BKN047	10.00	-RA	46	8.0	45	7.4	45	7.0	96	3	240		26.88			M	AA	0.04	29.67
09	0047	0	FEW026	10.00		46	8.0	45	7.4	45	7.0	96	2	260		26.87			M	AA	0.04	29.66
09	0058	0	CLR	10.00		47	8.5	46	8.0	46	7.5	96	7	260		26.88			29.58	AA	0.04	29.67
09	0103	0	CLR	10.00	-DZ	48	9.0	47	8.3	46	8.0	93	5	250		26.88			M	AA	0.05	29.67
09	0123	0	CLR	10.00		46	8.0	45	7.4	45	7.0	96	5	220		26.88			M	AA	0.05	29.67
09	0158	0	CLR	10.00		47	8.2	46	7.7	45	7.4	93	2	170		26.88	0	015	29.59	AA	0.05	29.67
09	0258	0	CLR	10.00		47	8.4	46	8.0	46	7.8	96	7	130		26.88			29.59	AA		29.67
09	0358	0	CLR	10.00		49	9.4	46	8.0	44	6.6	83	5	290		26.90			29.60	AA		29.69
09	0458	0	CLR	10.00		49	9.6	46	7.7	43	6.1	80	6	250		26.91	3	012	29.62	AA		29.71
09	0503	0	CLR	10.00		50	10.0	46	8.0	43	6.0	77	6	240		26.91			M	AA		29.71
09	0558	0	CLR	6.00	HZ	49	9.4	45	7.2	41	4.8	74	7	230		26.93			29.65	AA		29.73
09	0658	0	OVC006	2.00	HZ	49	9.5	43	6.2	37	2.6	63	7	230		26.94			29.66	AA		29.74
09	0713	0	OVC006	2.00	HZ	50	10.0	43	6.3	36	2.0	59	8	220		26.95			M	AA		29.75
09	0718	0	CLR	4.00	HZ	50	10.0	43	6.3	36	2.0	59	7	230		26.95			M	AA		29.75
09	0723	0	OVC	2.00		50	10.0	M	M	36	2.0	M	9	230		M			M	SP		29.75
09	0728	0	OVC	2.50		50	10.0	M	M	36	2.0	M	9	220		M			M	SP		29.76
09	0743	0	SCT005	2.50	HZ	50	10.0	43	6.3	36	2.0	59	10	220		26.96			M	AA		29.76
09	0753	0	FEW004	3.00	HZ	50	10.0	43	6.3	36	2.0	59	10	220		26.97			M	AA		29.77
09	0758	0	FEW004	3.00	HZ	51	10.3	44	6.6	36	2.2	57	11	220	18	26.96	2	017	29.69	AA		29.76
09	0858	0	CLR	4.00	HZ	53	11.9	44	6.9	35	1.5	51	16	210		26.98			29.70	AA		29.78
09	0958	0	CLR	10.00		56	13.4	45	7.0	32	0.0	40	11	280	18	27.00			29.72	AA		29.80
09	1043	0	FEW065 SCT190	10.00		59	15.0	46	7.8	32	0.0	36	13	230	22	27.00			M	AA		29.80
09	1050	0	FEW070 SCT190	10.00		59	15.0	46	7.8	32	0.0	36	13	280	23	27.00			M	AA		29.80
09	1051	0	FEW070 SCT190	10.00		59	15.0	46	7.8	32	0.0	36	13	290	23	27.00			M	AA		29.80
09	1052	0	FEW070 SCT190	10.00		59	15.0	46	7.8	32	0.0	36	15	300	23	27.00			M	AA		29.80
09	1058	0	FEW060 SCT075 SCT100	10.00		59	14.8	46	7.8	32	-0.2	36	10	290	18	27.01	1	012	29.75	AA		29.81
09	1158	0	CLR	10.00		61	15.9	46	7.6	28	-2.0	29	15	290	25	27.00			29.75	AA		29.80
09	1159	0	CLR	10.00		61	16.0	46	7.6	28	-2.0	29	13	300	25	27.00			M	AA		29.80
09	1219	0	FEW085	10.00		61	16.0	46	7.6	28	-2.0	29	14	260	23	27.00			M	AA		29.80
09	1258	0	FEW080 SCT140 SCT200	10.00		62	16.7	46	7.7	27	-2.9	26	10	260	23	27.00			29.74	AA		29.80
09	1329	0	FEW085	10.00		64	18.0	46	7.8	25	-4.0	23	18	300	25	27.00			M	AA		29.80
09	1347	0	FEW090	10.00		64	18.0	46	7.8	25	-4.0	23	18	280	24	26.99			M	AA		29.79
09	1358	0	SCT095	10.00		64	17.9	46	7.8	25	-4.1	23	18	290	23	26.99	6	007	29.73	AA		29.79

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	1458	0	SCT090 SCT160 BKN190	10.00		64	17.5	46	7.7	24	-4.3	22	14	290	23	26.99			29.73	AA		29.79
09	1532	0	FEW090	10.00		64	18.0	46	7.8	25	-4.0	23	13	290	26	27.00			M	AA		29.80
09	1550	0	BKN095 BKN170	10.00		64	18.0	46	7.5	23	-5.0	21	16	270	23	26.99			M	AA		29.79
09	1558	0	BKN095	10.00		64	17.9	46	7.7	24	-4.5	22	14	280	24	27.00			29.74	AA		29.80
09	1610	0	BKN095	10.00		64	18.0	46	7.5	23	-5.0	21	17	300	23	27.00			M	AA		29.80
09	1634	0	BKN095	10.00		64	18.0	46	7.5	23	-5.0	21	13	270	24	27.00			M	AA		29.80
09	1658	0	BKN100	10.00		64	17.7	46	7.5	23	-5.1	21	13	290		27.01	3	003	29.75	AA		29.81
09	1758	0	SCT095	10.00		63	17.1	45	7.0	21	-6.1	20	15	290	24	27.02			29.76	AA		29.82
09	1858	0	SCT095	10.00		62	16.4	44	6.7	21	-6.1	21	10	280		27.03			29.77	AA		29.83
09	1958	0	SCT100	10.00		61	15.9	44	6.6	22	-5.7	22	7	280		27.03	2	008	29.78	AA		29.84
09	2058	0	CLR	10.00		58	14.5	43	5.9	23	-4.8	26	6	250		27.06			29.81	AA		29.87
09	2158	0	CLR	10.00		54	12.4	41	5.2	25	-3.7	33	6	230		27.08			29.83	AA		29.89
09	2258	0	CLR	10.00		54	12.0	41	5.2	25	-3.8	33	10	230		27.09	1	019	29.84	AA		29.90
09	2358	0	OVC100	10.00		54	12.3	43	5.9	29	-1.9	38	8	260		27.10			29.85	AA		29.91

Figure A-102. Quality-controlled local climatological data hourly observations table for Davis-Monthan Air Force Base Airport, Tucson, AZ (04/09/2013). Note in the Weather Type column that HZ (haze) was reported, coincident with low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
YUMA MCAS (03145)
YUMA, AZ (04/08/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 213 ft. above sea level
Latitude: 32.65
Longitude: -114.616
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0055	5	CLR	10.00		69	20.6	57	13.6	46	7.8	44	6	270		29.42			29.64	AA		29.65
08	0155	5	CLR	10.00		67	19.4	56	13.1	46	7.8	47	6	210		29.41	6	011	29.63	AA		29.64
08	0255	5	CLR	10.00		66	18.9	56	13.1	47	8.3	51	7	180		29.38			29.60	AA		29.61
08	0355	5	CLR	10.00		65	18.3	56	13.2	48	8.9	54	0	000		29.38			29.60	AA		29.61
08	0455	5	CLR	10.00		64	17.8	55	12.9	48	8.9	56	7	170		29.37	6	015	29.59	AA		29.60
08	0555	5	CLR	10.00		63	17.2	56	13.5	51	10.6	65	11	160		29.34			29.57	AA		29.57
08	0655	5	FEW200	10.00		63	17.2	58	14.3	54	12.2	73	10	160		29.35			29.58	AA		29.58
08	0755	5	FEW050 SCT200	10.00		65	18.3	59	15.1	55	12.8	70	5	240		29.38	3	006	29.61	AA		29.61
08	0855	5	FEW200	10.00		70	21.1	62	16.8	57	13.9	64	15	190		29.35			29.57	AA		29.58
08	0955	5	FEW070 SCT200	10.00		73	22.8	60	15.7	51	10.6	46	15	180		29.33			29.55	AA		29.56
08	1055	5	FEW070	10.00		77	25.0	61	15.8	48	8.9	36	10	300		29.33	6	018	29.55	AA		29.56
08	1140	5	FEW070	2.00	BLDU	79	26.0	56	13.3	34	1.0	20	17	290	26	29.32			M	SP		29.55
08	1153	5	SCT070	3.00	BLDU	79	26.0	56	13.3	34	1.0	20	18	290	25	29.31			M	SP		29.54
08	1155	5	SCT070	3.00	BLDU	78	25.6	55	12.9	33	0.6	19	20	300	25	29.31			29.53	AA		29.54
08	1253	5	FEW060	2.00	BLDU	79	26.0	56	13.3	34	1.0	20	24	270	32	29.28			M	SP		29.51
08	1255	5	FEW060	2.00	BLDU	79	26.1	56	13.1	33	0.6	19	22	280	32	29.28			29.50	AA		29.51
08	1355	5	FEW060	2.00	BLDU	80	26.7	56	13.5	34	1.1	19	20	300	30	29.26	6	018	29.48	AA		29.49
08	1427	5	FEW060	1.75	BLDU	77	25.0	56	13.2	36	2.0	23	22	300	34	29.25			M	SP		29.48
08	1455	5	CLR	1.00	BLDU	75	23.9	55	12.6	35	1.7	23	28	300	38	29.24			29.46	AA		29.47
08	1528	5	CLR	0.75	BLDU	73	23.0	54	11.9	34	1.0	24	31	310	41	29.23			M	SP		29.46
08	1555	5	VV017	0.75	BLDU	73	22.8	53	11.5	32	0.0	22	32	310	43	29.24			29.46	AA		29.47
08	1602	5	VV017	0.75	BLDU	72	22.0	51	10.6	28	-2.0	19	28	300	43	29.24			M	SP		29.47
08	1655	5	VV017	0.50s	DSs	69	20.6	51	10.6	32	0.0	25	36	300	49	29.27	3	004	29.49	AA		29.50
08	1707	5	VV017	0.25s	+DSs	70	21.0	52	11.2	34	1.0	27	28	300	43	29.27			M	SP		29.50
08	1733	5	CLR	0.50s	DSs	66	19.0	50	10.2	34	1.0	31	31	300	47	29.28			M	SP		29.51
08	1755	5	FEW070	0.25s	+DSs	65	18.3	50	9.8	33	0.6	30	32	300	48	29.29			29.52	AA		29.52
08	1813	5	OVC015	0.25s	DSs	63	17.0	49	9.5	34	1.0	34	32	290	48	29.31			M	SP		29.54
08	1855	5	BKN015 BKN060	0.75	DS	62	16.7	48	9.0	33	0.6	34	31	290	45	29.32			29.54	AA		29.55
08	1906	5	BKN015 BKN060	1.00	BLDU	63	17.0	49	9.5	34	1.0	34	31	290	44	29.32			M	SP		29.55
08	1927	5	BKN050 OVC100	2.00	-RA BLDU	61	16.0	49	9.4	36	2.0	39	22	280	39	29.34			M	SP		29.57
08	1939	5	BKN050 OVC100	3.00	BLDU	61	16.0	49	9.4	36	2.0	39	22	280	31	29.34			M	SP		29.57
08	1955	5	BKN050 BKN100	3.00	BLDU	61	16.1	49	9.2	35	1.7	38	22	280	29	29.34	1	024	29.57	AA	T	29.57
08	2000	5	BKN015 BKN060	4.00	BLDU	61	16.0	49	9.4	36	2.0	39	22	280	30	29.34			M	SP		29.57
08	2055	5	BKN060	5.00	BLDU	60	15.6	48	8.7	34	1.1	38	22	290	31	29.37			29.59	AA		29.60
08	2155	5	BKN060	5.00	BLDU	59	15.0	48	8.6	35	1.7	41	18	270	25	29.39			29.61	AA		29.62

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	2255	5	SCT060	7.00		58	14.4	48	8.6	36	2.2	44	13	270		29.41	1	024	29.63	AA		29.64
08	2355	5	SCT060	7.00		58	14.4	48	8.6	36	2.2	44	17	280		29.43			29.65	AA		29.66

Figure A-103. Quality-controlled local climatological data hourly observations table for Yuma Marine Corps Air Station, Yuma, AZ (04/08/2013). Note in the Weather Type column that BLDU (blowing dust) and DS (dust storm) were reported, coincident with gusty winds and low visibilities. Specific visibility obstructions (such as blowing dust) are manually entered by human observers and are not reported automatically. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA HOURLY OBSERVATIONS TABLE YUMA MCAS (03145) YUMA, AZ (04/09/2013)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 213 ft. above sea level
Latitude: 32.65
Longitude: -114.616
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0055	5	SCT100	7.00		59	15.0	48	8.7	35	1.7	41	22	290	28	29.44			29.66	AA		29.67
09	0155	5	SCT100	7.00		58	14.4	48	8.6	36	2.2	44	15	280		29.45	1	012	29.67	AA		29.68
09	0255	5	BKN100	7.00		58	14.4	47	8.4	35	1.7	42	11	300		29.45			29.67	AA		29.68
09	0355	5	BKN100	10.00		58	14.4	47	8.4	35	1.7	42	10	300		29.46			29.69	AA		29.69
09	0455	5	SCT100	10.00		56	13.3	46	7.7	34	1.1	44	8	300		29.48	3	012	29.71	AA		29.71
09	0555	5	SCT100	10.00		56	13.3	46	7.5	33	0.6	42	8	320		29.51			29.73	AA		29.74
09	0655	5	FEW100	10.00		57	13.9	46	7.7	33	0.6	40	10	290		29.53			29.76	AA		29.76
09	0755	5	FEW100	10.00		59	15.0	47	8.3	33	0.6	38	13	290		29.56	1	025	29.78	AA		29.79
09	0855	5	FEW100	10.00		63	17.2	49	9.1	32	0.0	31	14	290		29.57			29.80	AA		29.80
09	0955	5	FEW100	10.00		68	20.0	50	10.0	30	-1.1	24	15	290		29.59			29.81	AA		29.82
09	1055	5	FEW100	10.00		73	22.8	50	9.8	20	-6.7	13	14	330	21	29.59	1	010	29.81	AA		29.82
09	1155	5	FEW120	10.00		75	23.9	50	9.9	16	-8.9	11	15	320	28	29.58			29.80	AA		29.81
09	1255	5	FEW120	10.00		77	25.0	51	10.4	16	-8.9	10	16	320	26	29.57			29.79	AA		29.80
09	1355	5	FEW120	10.00		78	25.6	51	10.6	16	-8.9	9	14	270	18	29.56	6	008	29.78	AA		29.79
09	1455	5	FEW120	10.00		78	25.6	51	10.5	15	-9.4	9	13	360	23	29.55			29.77	AA		29.78
09	1555	5	FEW120	10.00		79	26.1	51	10.7	14	-10.0	8	17	350	23	29.54			29.77	AA		29.77
09	1655	5	CLR	10.00		78	25.6	51	10.5	15	-9.4	9	11	270	22	29.54	6	007	29.76	AA		29.77
09	1755	5	CLR	10.00		77	25.0	51	10.4	16	-8.9	10	11	300		29.55			29.77	AA		29.78
09	1855	5	CLR	10.00		74	23.3	50	9.8	18	-7.8	12	5	290		29.56			29.78	AA		29.79
09	1955	5	CLR	10.00		72	22.2	48	8.8	13	-10.6	10	0	000		29.59	3	016	29.81	AA		29.82
09	2055	5	CLR	10.00		70	21.1	47	8.5	15	-9.4	12	3	300		29.61			29.83	AA		29.84
09	2155	5	CLR	10.00		66	18.9	47	8.2	21	-6.1	18	0	000		29.63			29.85	AA		29.86
09	2255	5	CLR	10.00		64	17.8	47	8.4	26	-3.3	24	7	300		29.65	3	022	29.88	AA		29.88
09	2355	5	CLR	10.00		63	17.2	49	9.3	33	0.6	33	5	320		29.68			29.90	AA		29.91

Figure A-104. Quality-controlled local climatological data hourly observations table for Yuma Marine Corps Air Station, Yuma, AZ (04/09/2013). Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

Appendix B:
Media Coverage, Videos, and Images

Video Links

ADEQ visibility cameras in the Phoenix area (clicking each link will download a video):

- Camelback Mountains: http://www.phoenixvis.net/videos/mpeg4/CAME_04082013.mp4
- Estrella Mountains: http://www.phoenixvis.net/videos/mpeg4/ESMO_04082013.mp4
- South Mountain: http://www.phoenixvis.net/videos/mpeg4/SOMT_04082013.mp4
- Superstition Mountains: http://www.phoenixvis.net/videos/mpeg4/SUPM_04082013.mp4
- White Tank Mountain: http://www.phoenixvis.net/videos/mpeg4/WHTM_040820131.mp4

Local citizens often create videos during dust storms, documenting their observations. Here are links to two of these videos:

- http://www.youtube.com/watch?v=Ijx7e2L3A5E
- http://www.youtube.com/watch?v=SlociUHcnDw

Media Coverage

http://azstarnet.com/news/weather/i--wrecks-blamed-on-dust-windstorm/article_707559f1-071e-508a-a0cf-981542792d59.html

I-10 wrecks blamed on dust, windstorm

Tuesday, April 9, 2013
Carmen Duarte, Arizona Daily Star

A storm system created up to 60 mph winds and blowing dust Monday that caused multiple-vehicle crashes on I-10 near Picacho, authorities said.

Overnight, the Tucson area got a rainstorm, and a slight chance of rain was predicted for today. There's a chance of snow in the higher elevations, cooler temperatures and breezy conditions, the National Weather Service said.

On Monday, two tractor-trailer rigs jackknifed, and two passenger vehicles were involved in a crash on westbound Interstate 10 at Milepost 213 near Picacho around 2 p.m., a state Department of Public Safety spokesman said.

Four people were taken to Tucson-area hospitals with non-life-threatening injuries, DPS Officer Raul Molina said.

One rig hauling produce rolled and blocked an eastbound lane on the interstate, Molina said. That crash and other nonserious wrecks, including a chain reaction crash near Milepost 212, were related to blowing dust, authorities said.

Motorists along I-10 between Phoenix and Tucson dealt with dust and wind gusts up to 60 mph, the Arizona Department of Transportation reported. Low visibility also closed a stretch of Interstate 40 east of Flagstaff in Northern Arizona for several hours Monday.

Southern Arizona between Tucson and the New Mexico line also experienced strong winds, but no crashes were reported.

Wind gusts in Tucson reached 49 mph, the weather service said.

Today's high in Tucson is expected to be in the mid-60s and the low in the 40s, according to the weather service. Winds are expected to reach 15 to 25 mph by this afternoon.

Highs are expected to go up on Wednesday and Thursday.

Overnight and into this morning, Mount Lemmon was expected to receive some snow, with the snow level dropping to 6,500 feet, the weather service said. There is a 50 percent chance of rain in the Santa Catalina Mountains today.

April snow already fell Monday on parts of Flagstaff, Kingman and the Grand Canyon.

http://nation.time.com/2013/04/09/storm-closes-wyoming-highways-delays-denver-flights/

Storm Closes Wyoming Highways; Delays Denver Flights

Tuesday, April 9, 2013
Associated Press

(DENVER) — A storm that toppled trees, whipped up blinding dust storms and may have spawned some tornadoes closed highways in Wyoming Tuesday and was slowing flights at Denver International Airport.

In Wyoming, a 100-mile stretch of Interstate 25 between Cheyenne and Douglas was closed as well as a 125-mile section of I-80 between Laramie and Rawlins. More than a foot of snow had fallen as of midmorning in Lander. In Pine Bluffs, near the Nebraska border, wind has created 1- to 2- foot drifts out of the snow that has fallen there.

Wind gusts up to 71 mph damaged a marina and windows in Sweetwater County.
The storm has so far proved less potent than originally predicted in Colorado because the cold front lingered in Wyoming.

Up to around 10 inches of snow had fallen in Colorado's mountains by dawn Tuesday. Another 5 to 10 inches was possible in some locations but final snowfall amounts would vary quite a bit, National Weather Service forecaster Jim Daniels said. Up to a foot had been in expected in Denver but forecasters are now calling for around 5 inches.

The storm has canceled 465 flights at Denver International Airport and deicing was causing departing flights to be delayed by as much as a half hour.

Blizzard warnings are also in effect from south of Denver to the New Mexico line and in northwestern Colorado. Winds gusting up to 50 mph were expected there.

As the storm moved in Monday night, spotters reported two tornadoes near Akron in eastern Colorado. Northern California was first to feel the lashing blasts of the storm Monday, which spread to the Sacramento and San Joaquin valleys.

At least a dozen trees came down in San Francisco, police officer John Tozzini told KGO-TV, which reported that more than 20,000 utility customers lost power in the region. A swath of outages occurred across the Sacramento Municipal Utility District, the Sacramento Bee reported.

A tree smashed into a Sacramento home where four friends were playing bridge, but they didn't stop playing their game Monday, according to KCRA.

Gusts topped 80 mph at some places in Southern California. The blustery system was being fueled by a cold front. "It's just a cold, really strong upper low," said Carol Smith, a meteorologist with the National Weather Service in Oxnard, Calif.

Whitecaps flecked the Pacific Ocean along the California coast, where gale warnings and small craft advisories were posted. Recreational boaters were warned to stay in port. Wind-driven

swells slapped over the tops of breakwaters and turned waves into a churning froth under piers at points such as Redondo Beach and Manhattan Beach on the Los Angeles County coast. The wind turned small wildfires into big problems in some areas, including a blaze in Fillmore about 50 miles northwest of Los Angeles that burned two homes and forced the evacuation of 84 homes.

Blowing dust forced the closure of state Route 14 in the high desert Antelope Valley north of Los Angeles due to low visibility. Officer Michael Farrell said motorists who stopped on the road were hit from behind by other cars, but no major injuries were reported.

The power went out for more than 13,000 Southern Californians because of the winds and the weather.

The rush of air had an upside: California's main power grid manager, the Independent System Operator, reported that turbines spinning within the ISO grid produced a record of 4,196 megawatts Sunday. The previous record was 3,944 megawatts on March 3.

In Arizona, gusty winds produced by a cold front enveloped Phoenix in a dusty haze and closed 34 miles of Interstate 40 in the northern part of the state for several hours Monday. At least four people were injured in a pileup when two semi-trucks jackknifed in a dust storm on I-10 in southern Arizona. The injuries were not life-threatening.

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Associated Press writers Greg Risling and John Antczak in Los Angeles; Paul Davenport and Walter Berry in Phoenix; and Colleen Slevin and Catherine Tsai in Denver contributed to this story.

http://news.yahoo.com/photos/tourists-watch-top-south-mountain-gusty-winds-envelop-photo-030644646.html

Tourists watch from the top of South Mountain as gusty winds envelop Phoenix in a dusty haze Monday, April 8, 2013. (AP Photo/Ross D. Franklin)

Appendix C:
Historical Norm Graphs – Grouped by Nonattainment Area

This section contains scatterplots and histograms of 24-hour average PM_{10} concentrations at monitors that exceeded the PM_{10} NAAQS on April 8 or 9, 2013. The data illustrate that the 24-hour average PM_{10} concentrations measured on the exceedance days were historically unusual. The graphs are grouped by nonattainment area.

- Maricopa County (Phoenix) graphs start on this page
- Yuma graphs are on page C-14
- Ajo graphs are on page C-15
- Rillito/Pima County graphs start on page C-16
- Hayden and Miami graphs are on page C-22
- Nogales graphs start on page C-23
- Douglas graphs are on page C-25

Maricopa County (Phoenix)

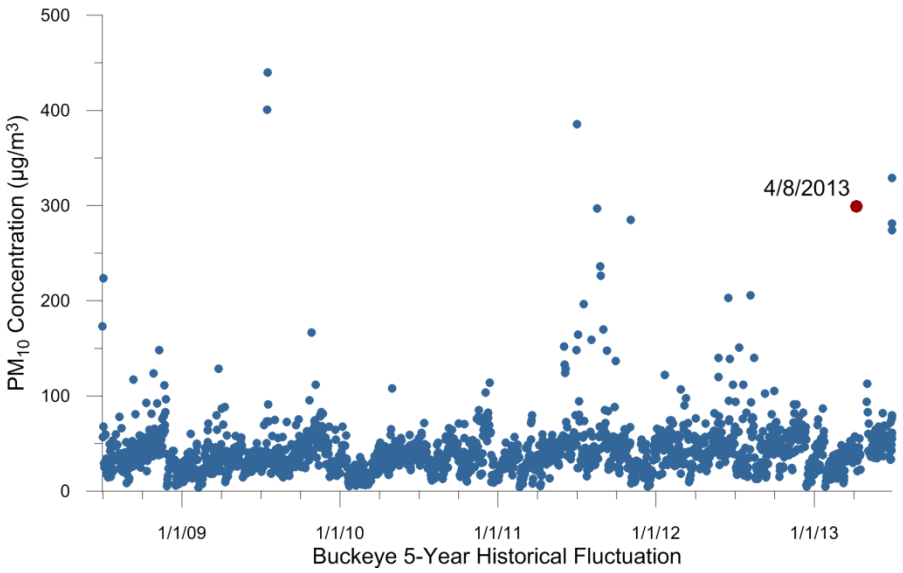

Figure C-1. 24-hr average PM_{10} concentrations at the Buckeye monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red.

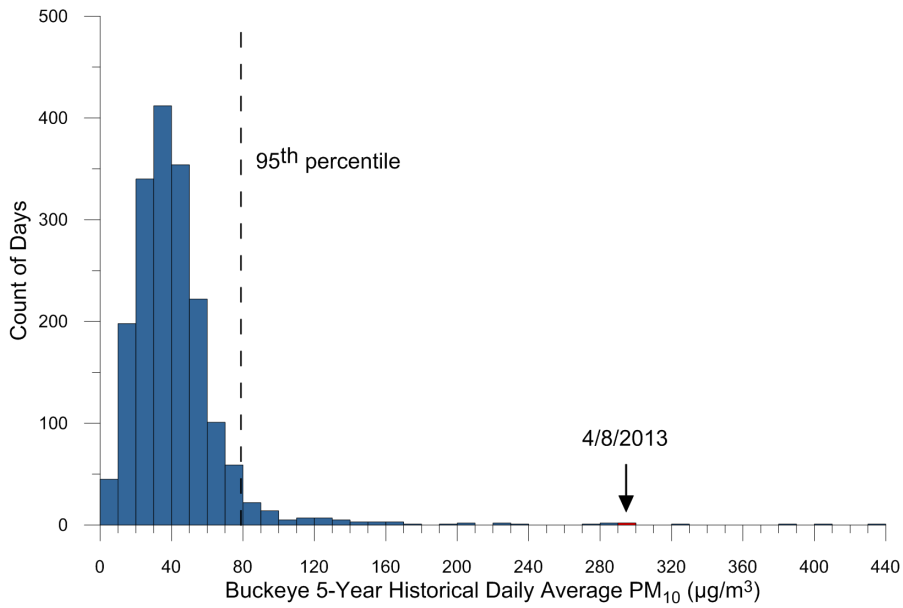

Figure C-2. 24-hr average PM_{10} concentrations at the Buckeye monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over three times higher than the 95th percentile.

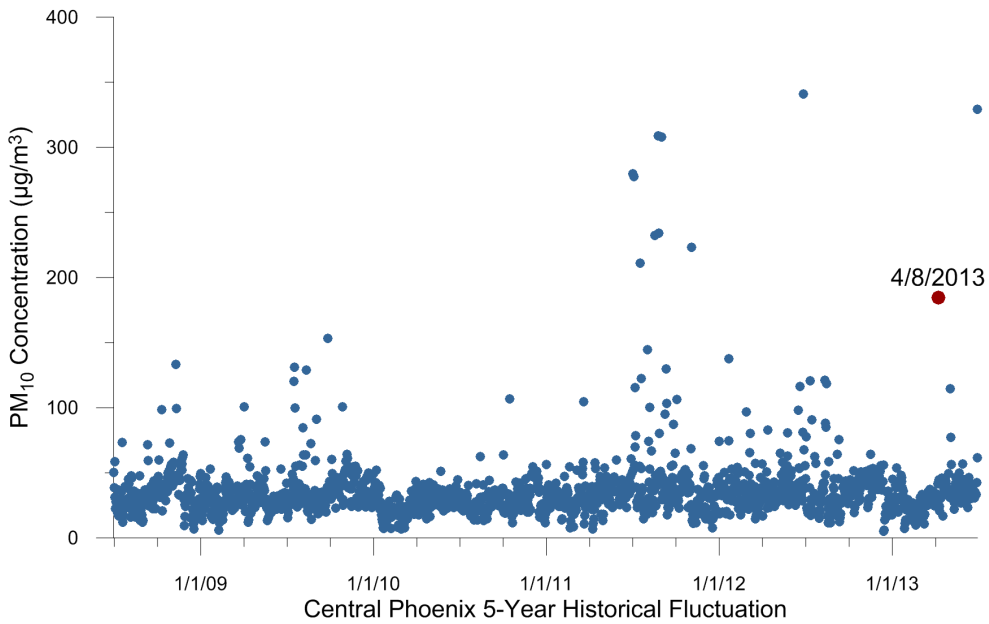

Figure C-3. 24-hr average PM_{10} concentrations at the Central Phoenix monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red.

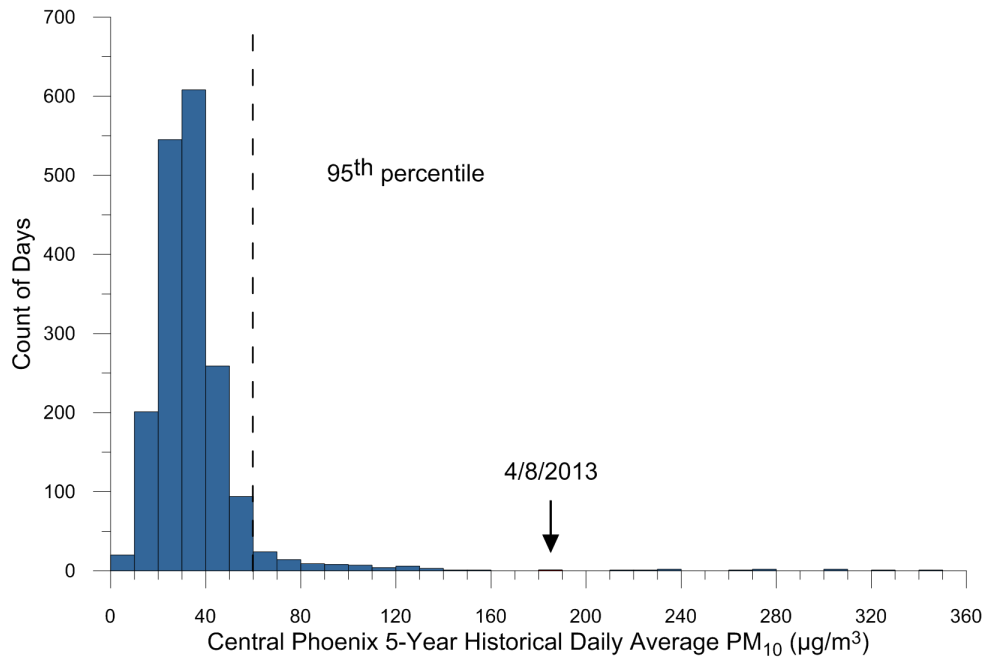

Figure C-4. 24-hr average PM_{10} concentrations at the Central Phoenix monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was approximately three times the 95th percentile.

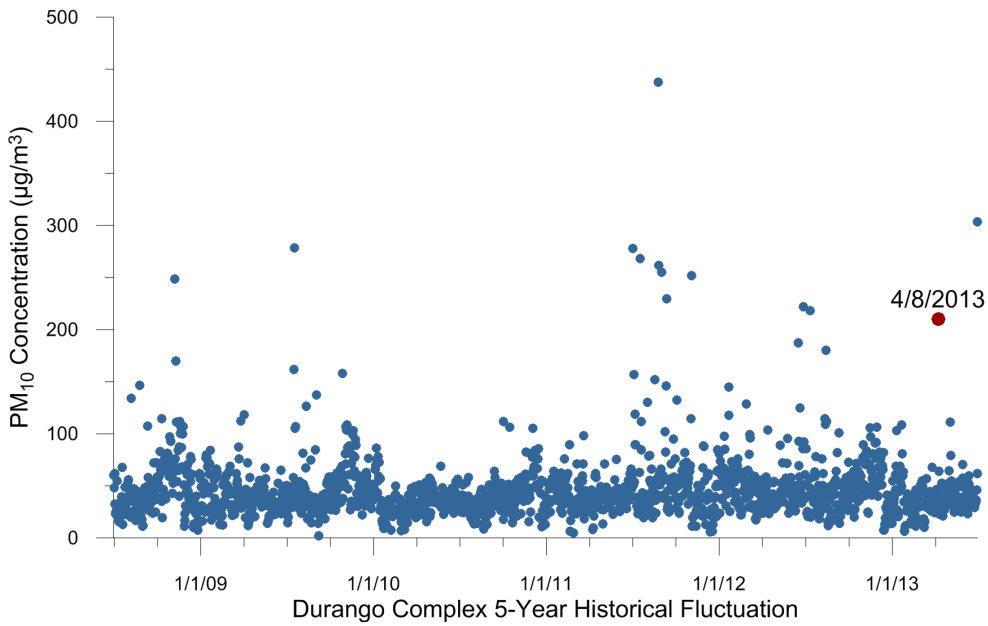

Figure C-5. 24-hr average PM_{10} concentrations at the Durango Complex monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red.

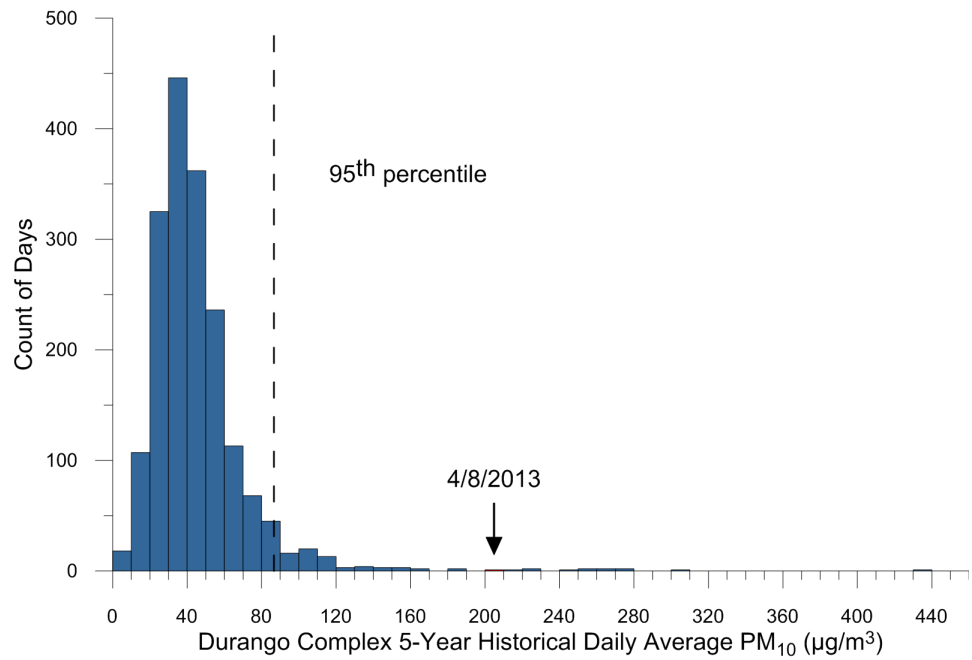

Figure C-6. 24-hr average PM_{10} concentrations at the Durango Complex monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over two times higher than the 95th percentile.

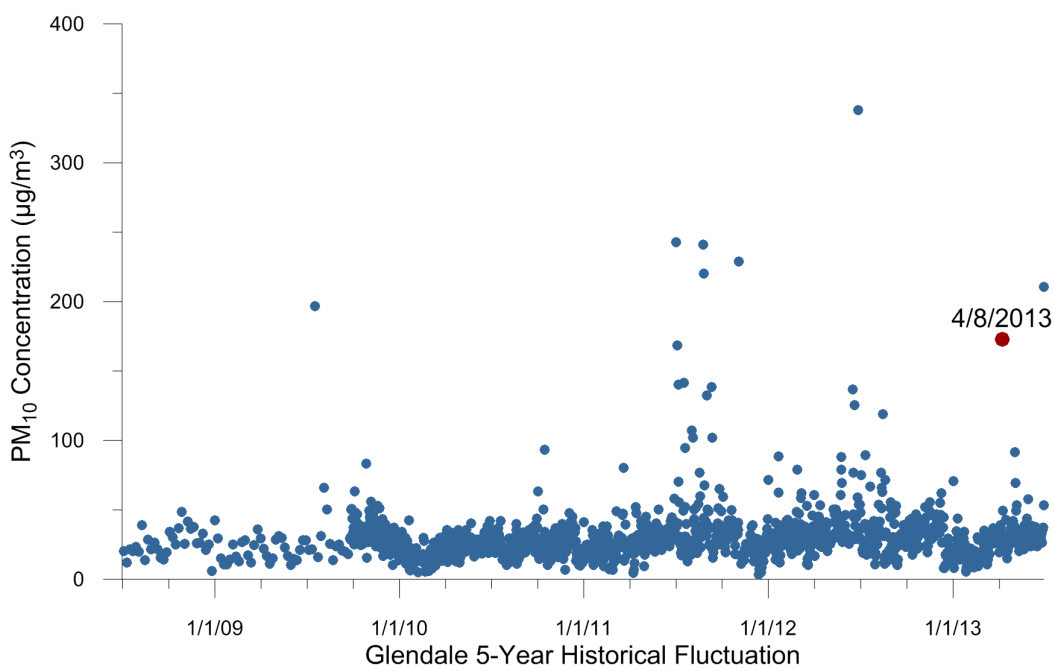

Figure C-7. 24-hr average PM_{10} concentrations at the Glendale monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red. Prior to September 25, 2009, the Glendale monitor operated on a one-in-six day schedule.

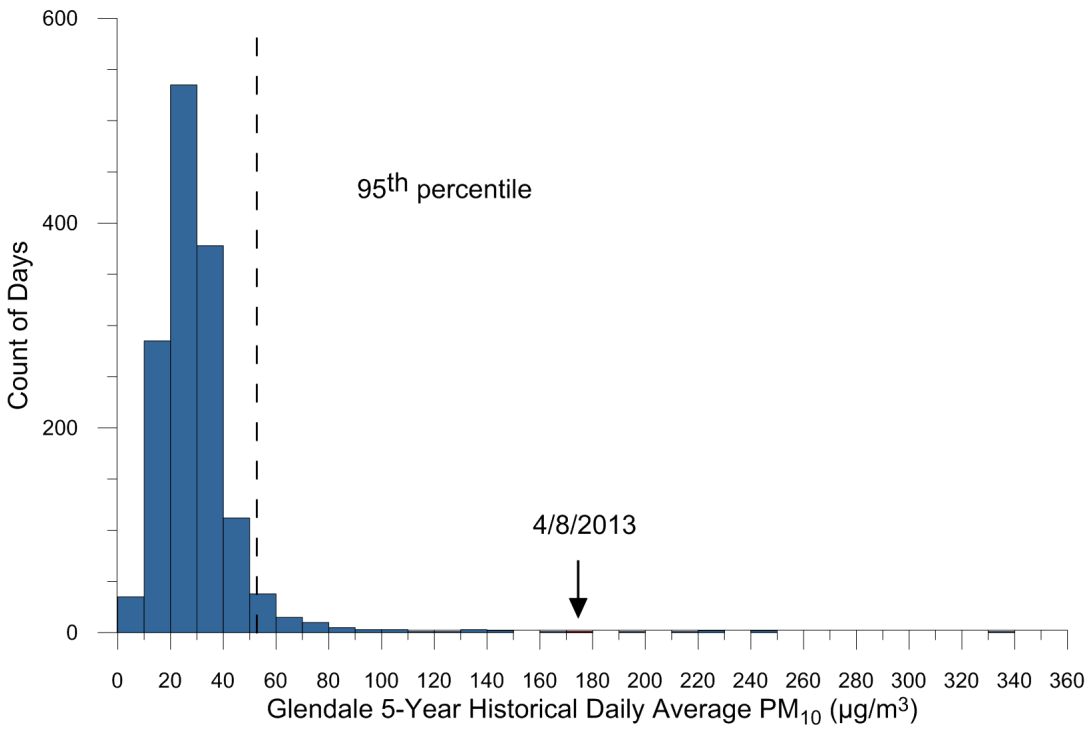

Figure C-8. 24-hr average PM_{10} concentrations at the Glendale monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was approximately three times higher than the 95th percentile.

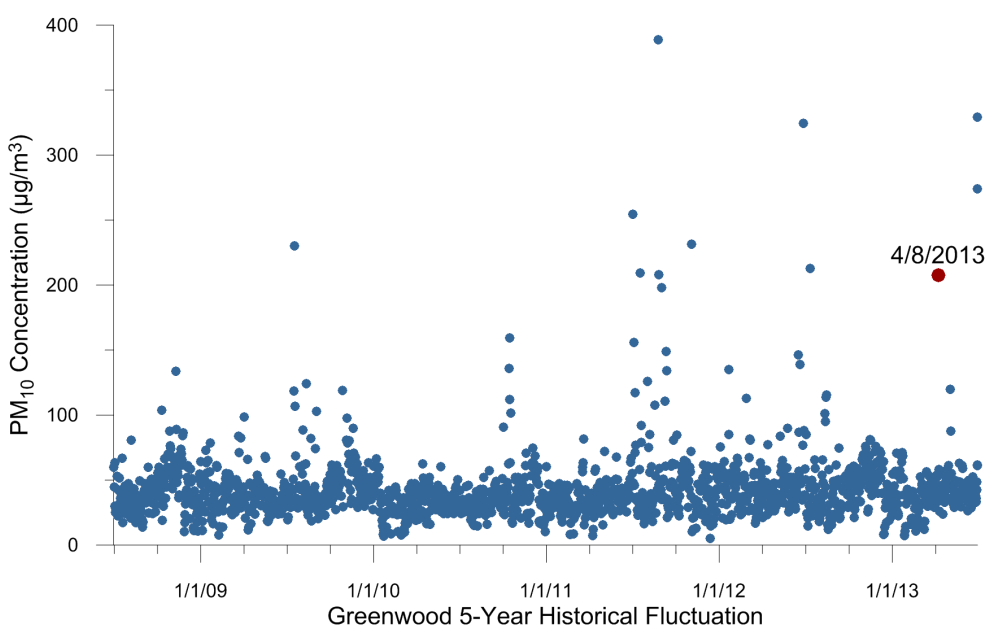

Figure C-9. 24-hr average PM_{10} concentrations at the Greenwood monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red.

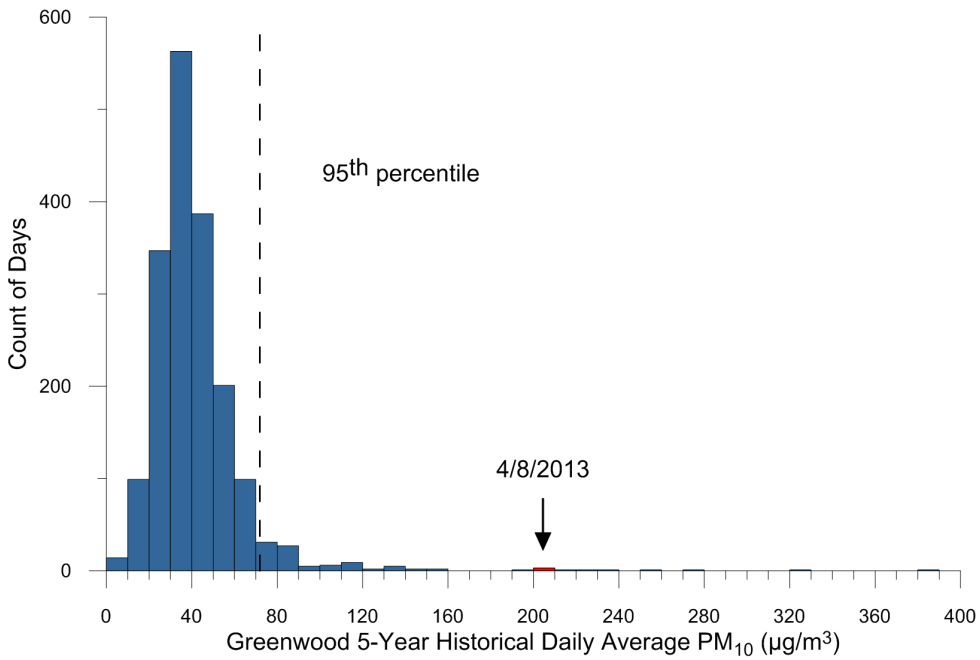

Figure C-10. 24-hr average PM_{10} concentrations at the Greenwood monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was approximately three times higher than the 95th percentile.

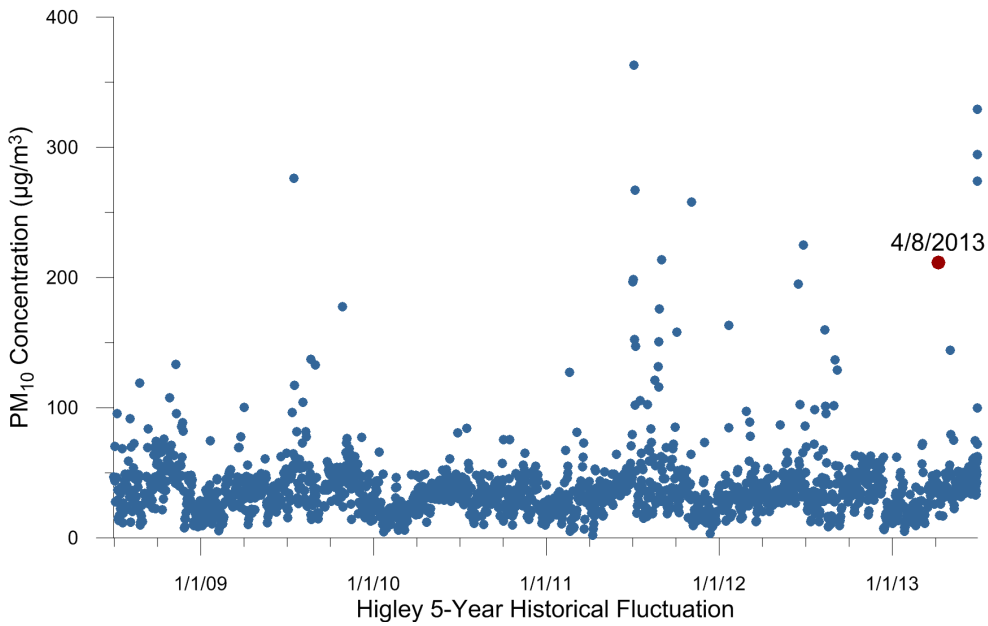

Figure C-11. 24-hr average PM_{10} concentrations at the Higley monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red.

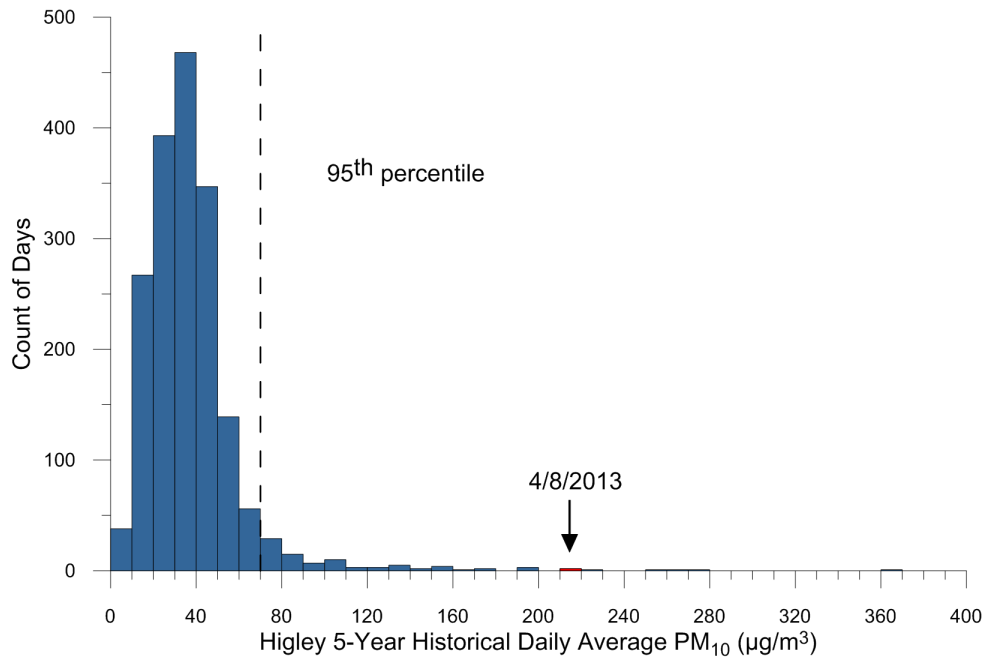

Figure C-12. 24-hr average PM_{10} concentrations at the Higley monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over three times higher than the 95th percentile.

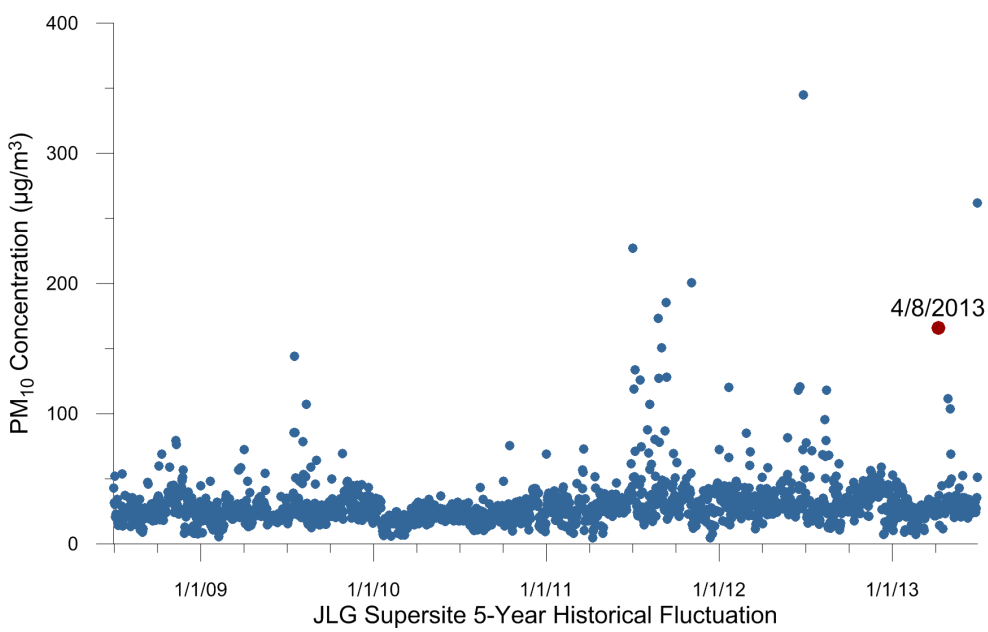

Figure C-13. 24-hr average PM_{10} concentrations at the JLG Supersite monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red.

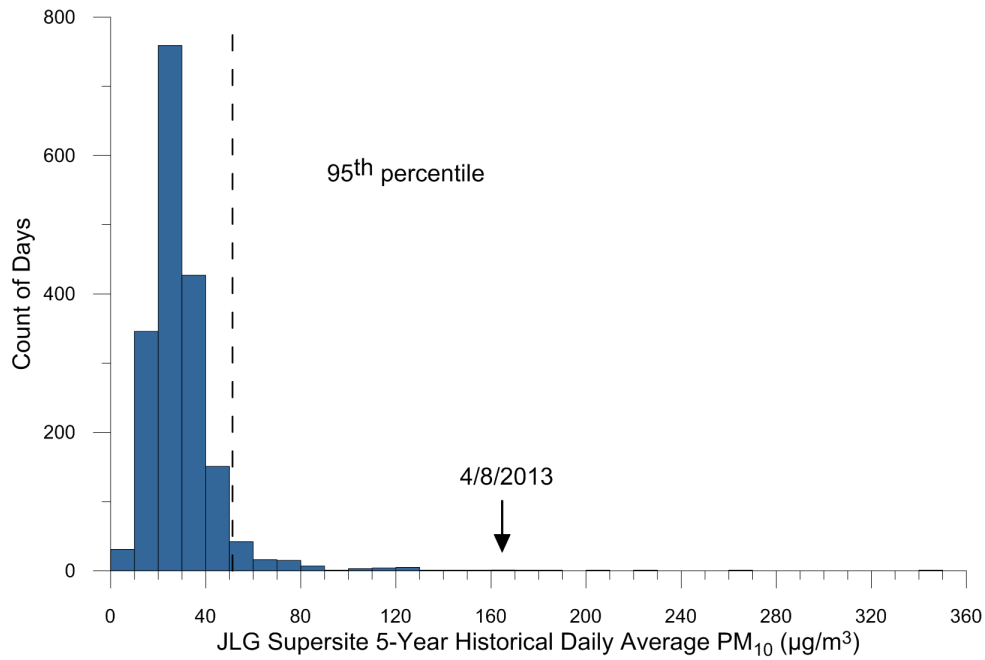

Figure C-14. 24-hr average PM_{10} concentrations at the JLG Supersite monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over three times higher than the 95th percentile.

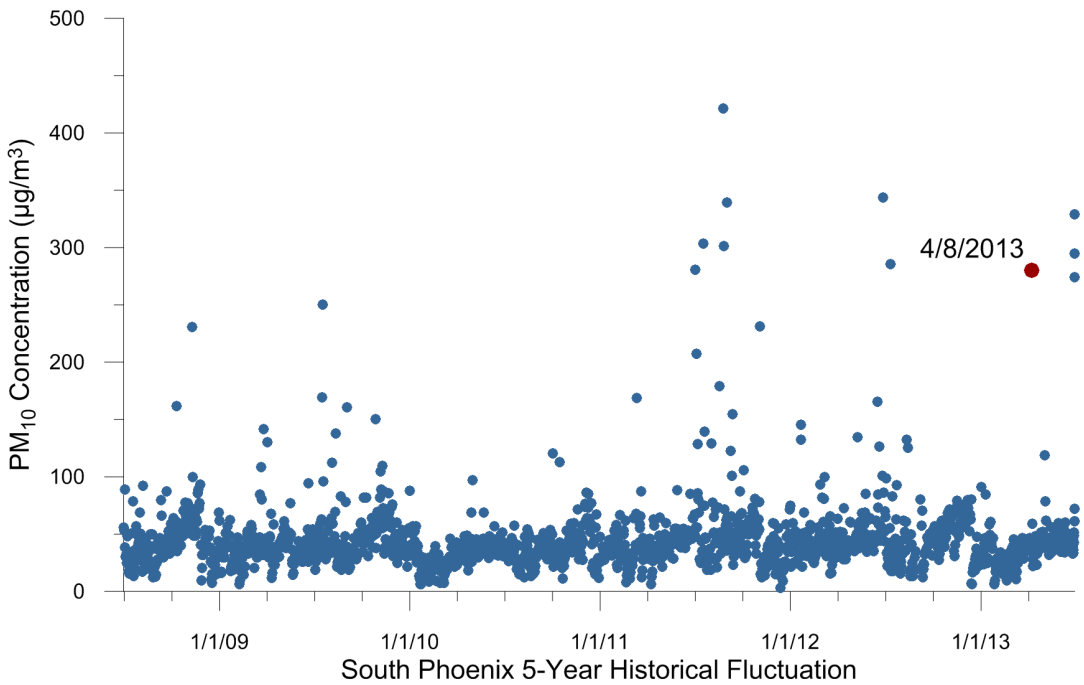

Figure C-15. 24-hr average PM_{10} concentrations at the South Phoenix monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red.

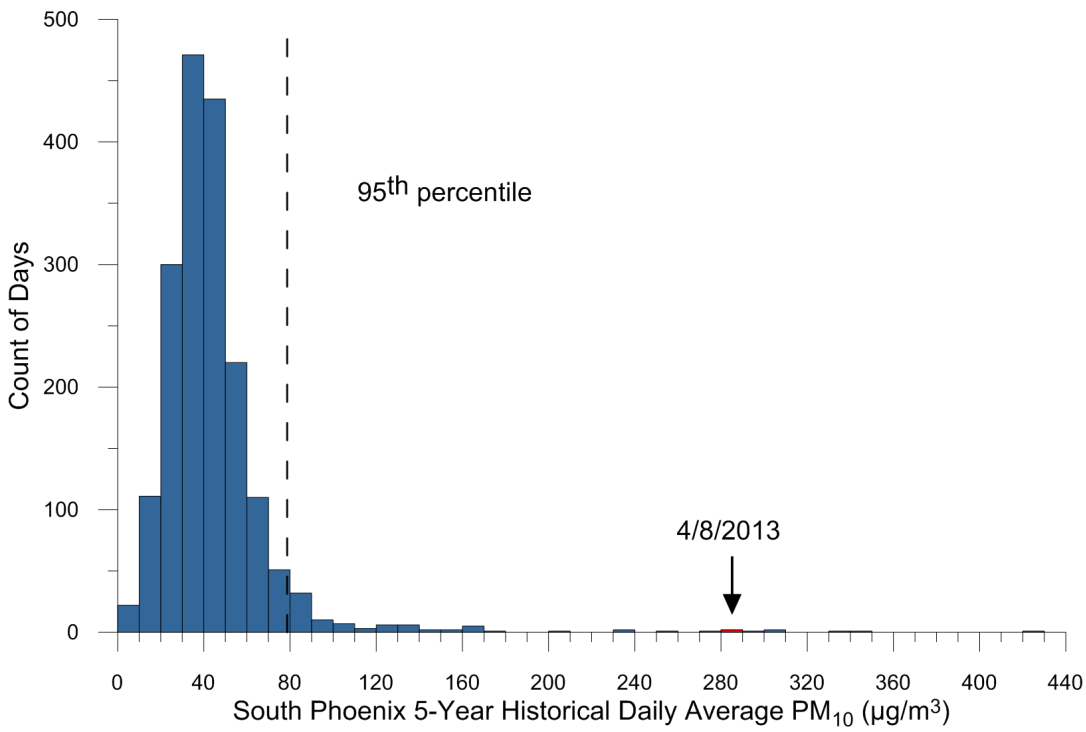

Figure C-16. 24-hr average PM_{10} concentrations at the South Phoenix monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over three times higher than the 95th percentile.

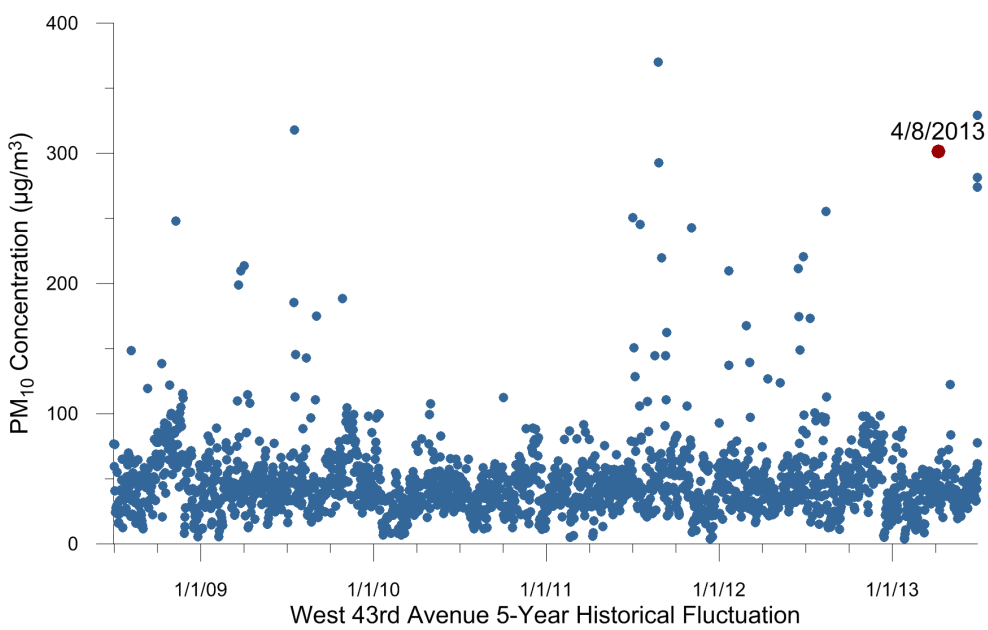

Figure C-17. 24-hr average PM_{10} concentrations at the West 43rd monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red.

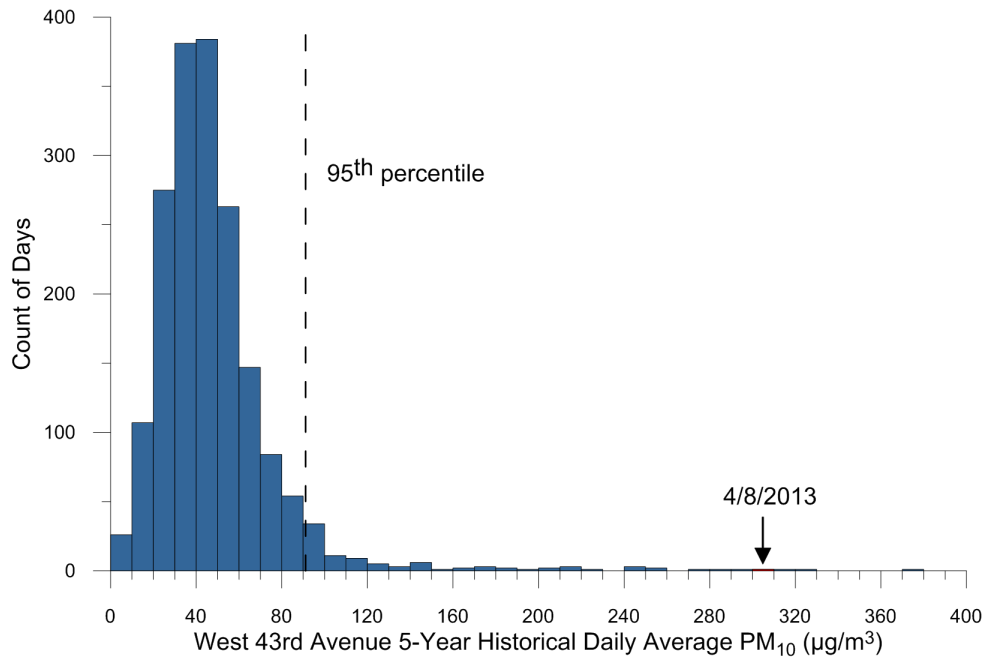

Figure C-18. 24-hr average PM_{10} concentrations at the West 43rd Avenue monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over three times higher than the 95th percentile.

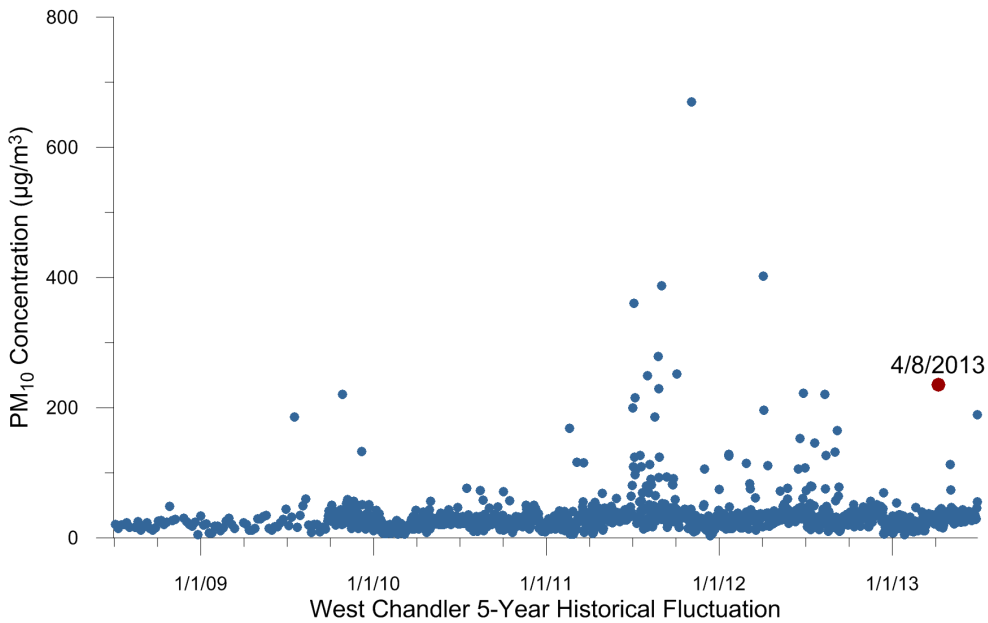

Figure C-19. 24-hr average PM_{10} concentrations at the West Chandler monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red. Prior to September 26, 2009, the West Chandler monitor operated on a one-in-six day schedule.

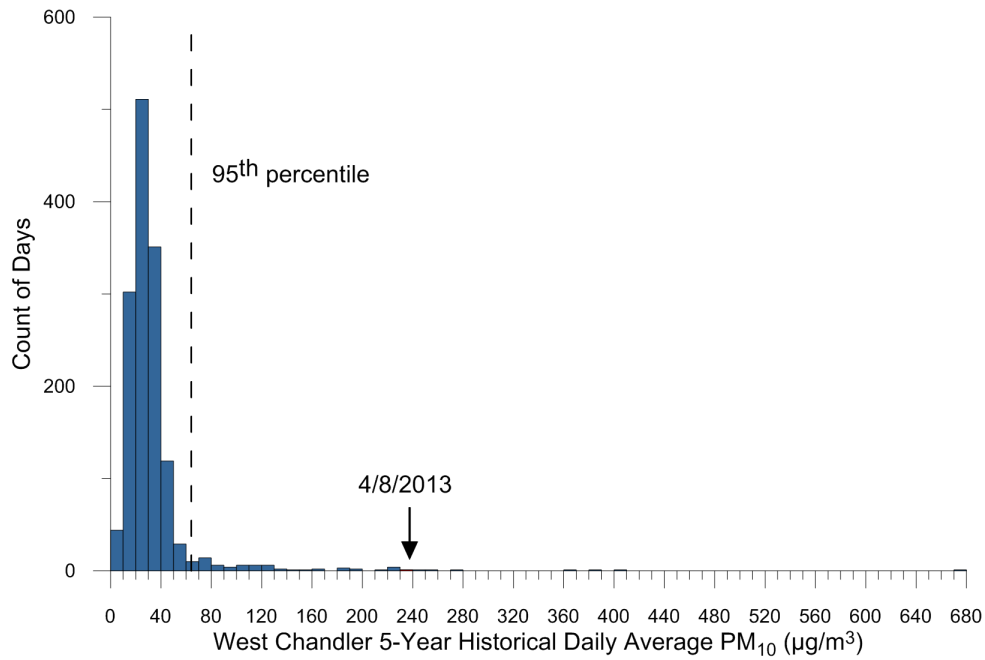

Figure C-20. 24-hr average PM_{10} concentrations at the West Chandler monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over three times higher than the 95th percentile.

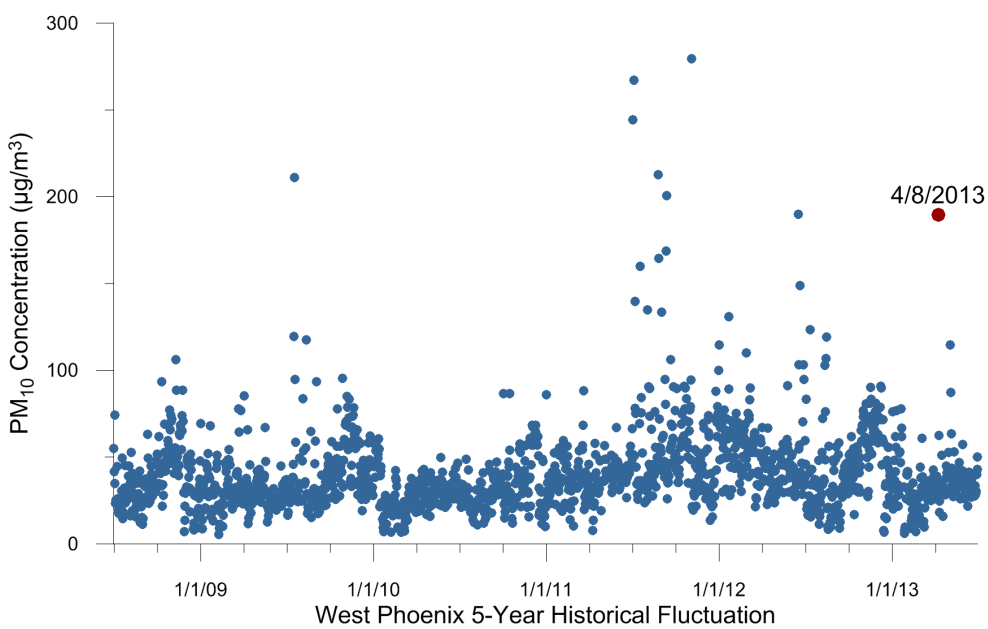

Figure C-21. 24-hr average PM_{10} concentrations at the West Phoenix monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red.

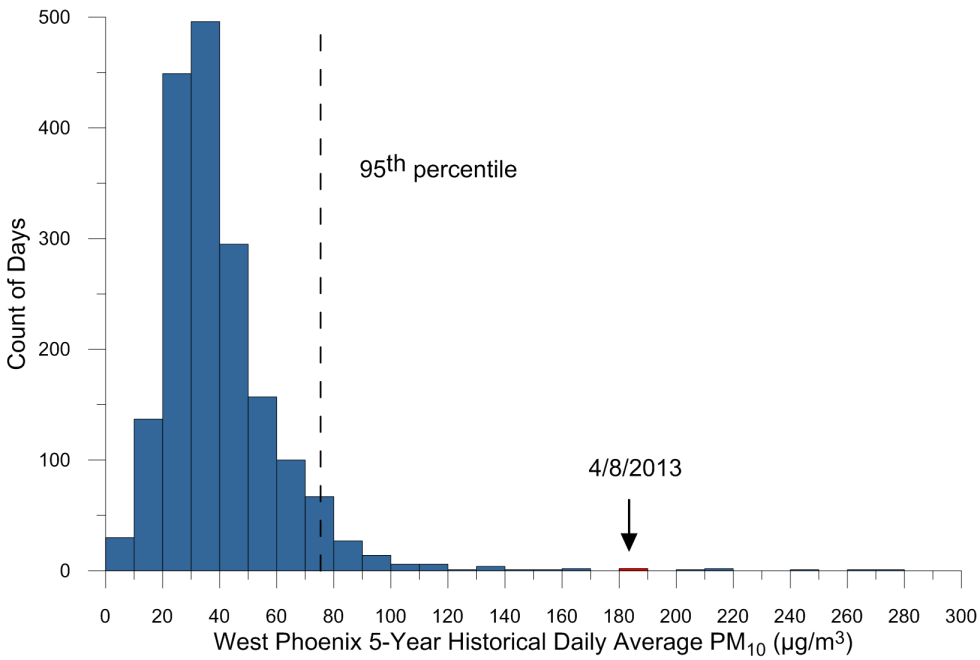

Figure C-22. 24-hr average PM_{10} concentrations at the West Phoenix monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over two times higher than the 95th percentile.

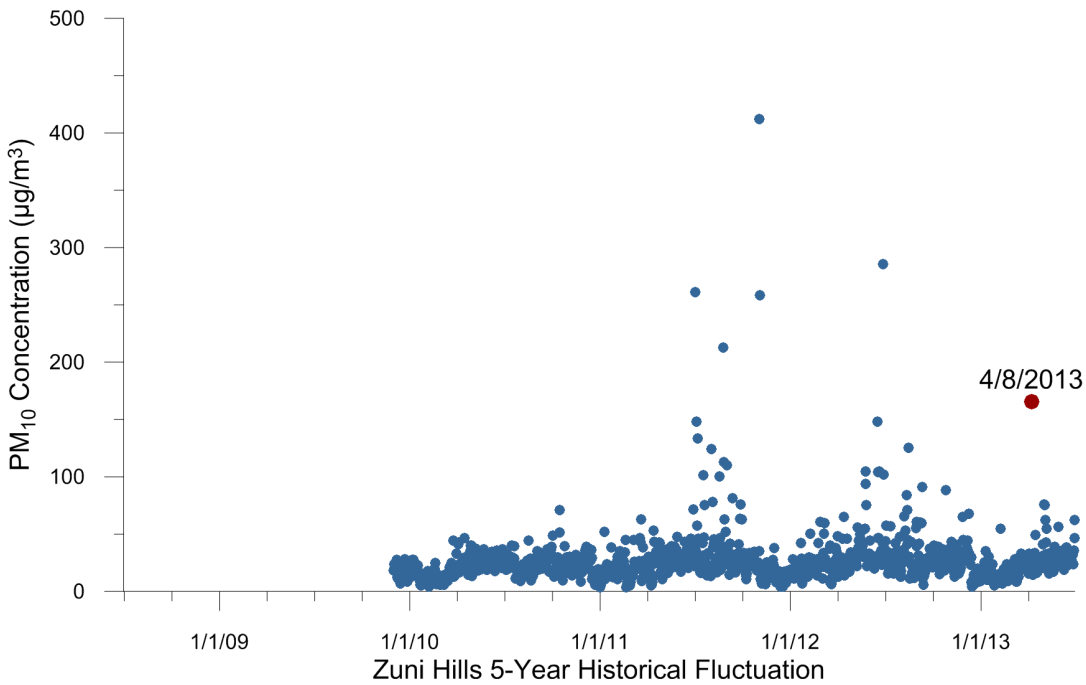

Figure C-23. 24-hr average PM_{10} concentrations at the Zuni Hills monitor for December 2009−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red. Data collection at the Zuni Hills monitor began on December 1, 2009.

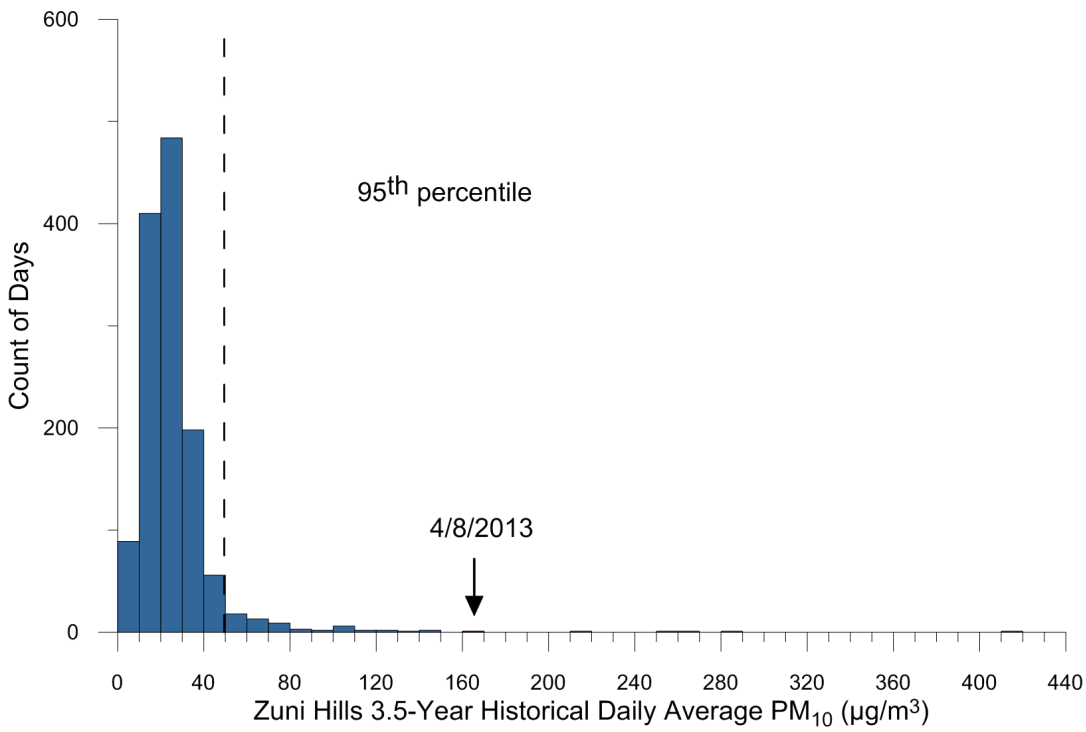

Figure C-24. 24-hr average PM_{10} concentrations at the Zuni Hills monitor for December 2009−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over three times higher than the 95th percentile.

Yuma

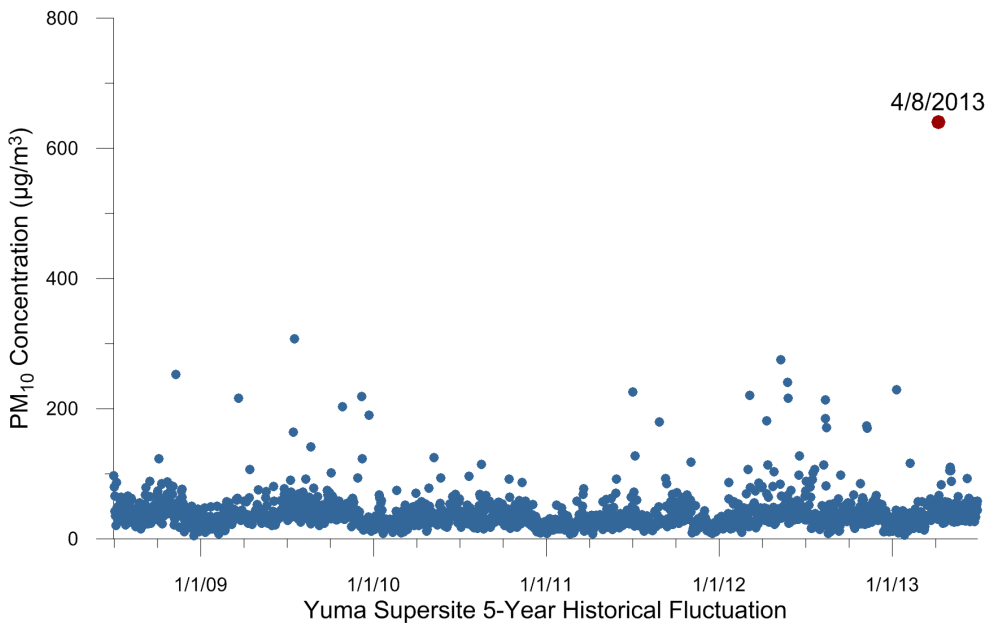

Figure C-25. 24-hr average PM_{10} concentrations at the Yuma Supersite monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red.

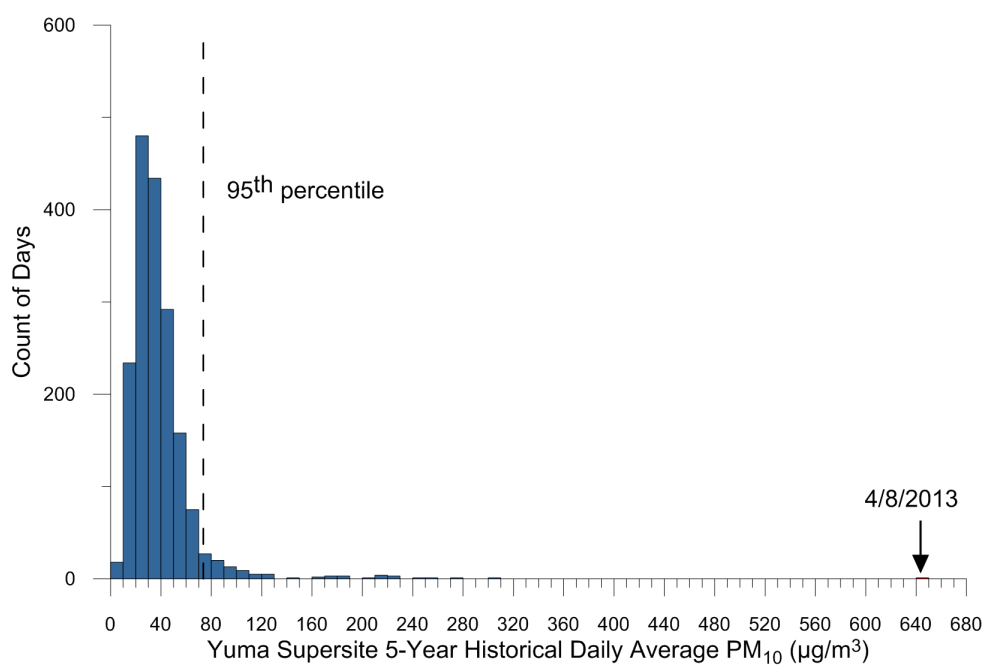

Figure C-26. 24-hr average PM_{10} concentrations at the Yuma Supersite monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over eight times higher than the 95th percentile.

Ajo

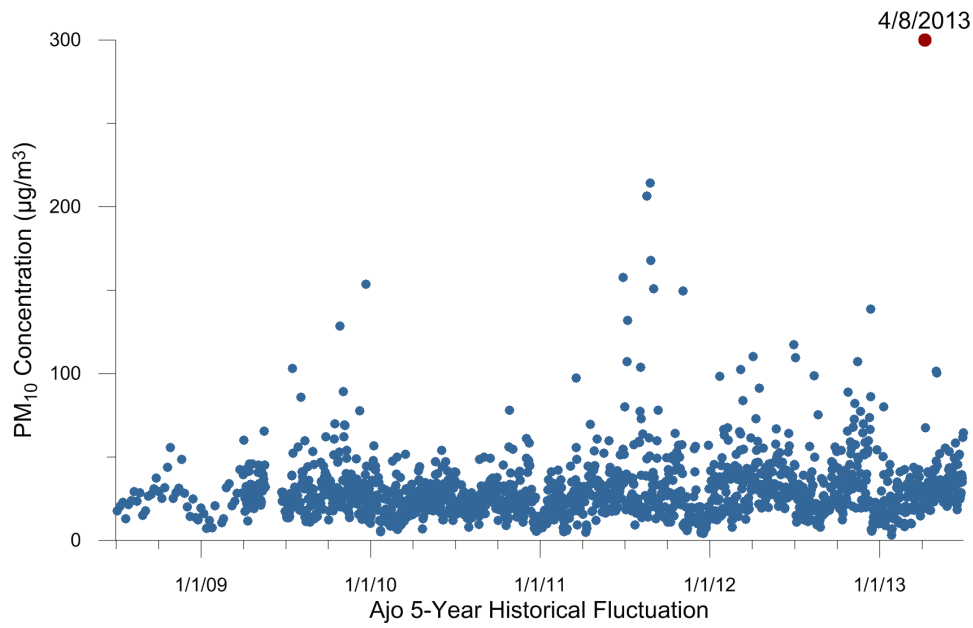

Figure C-27. 24-hr average PM_{10} concentrations at the Ajo monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red. Prior to April 1, 2009, the Ajo monitor operated on a one-in-six day schedule.

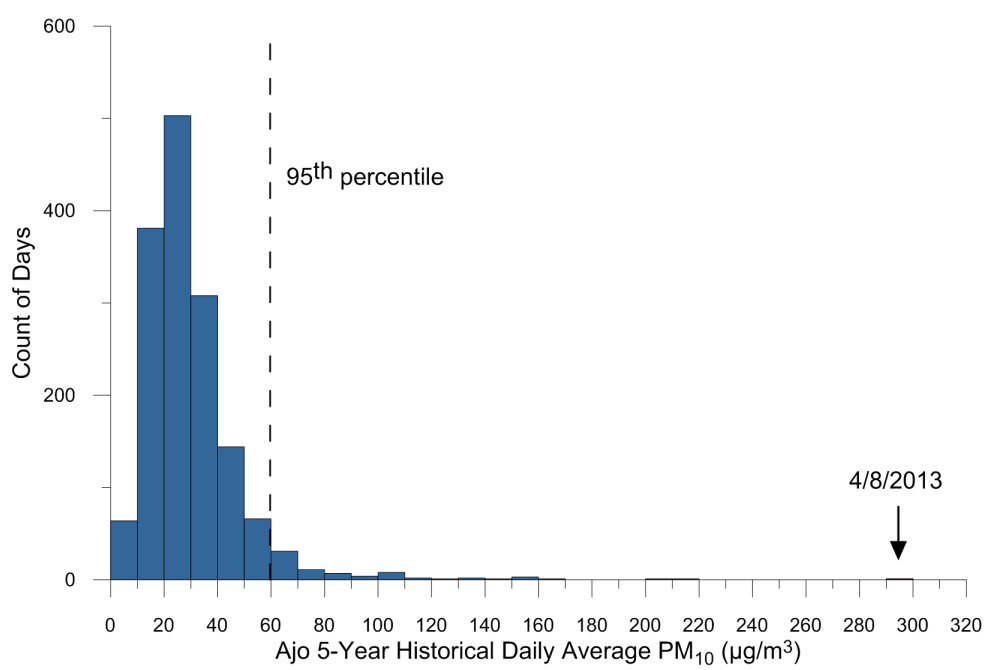

Figure C-28. 24-hr average PM_{10} concentrations at the Ajo monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over four times higher than the 95th percentile.

Rillito/Pima County

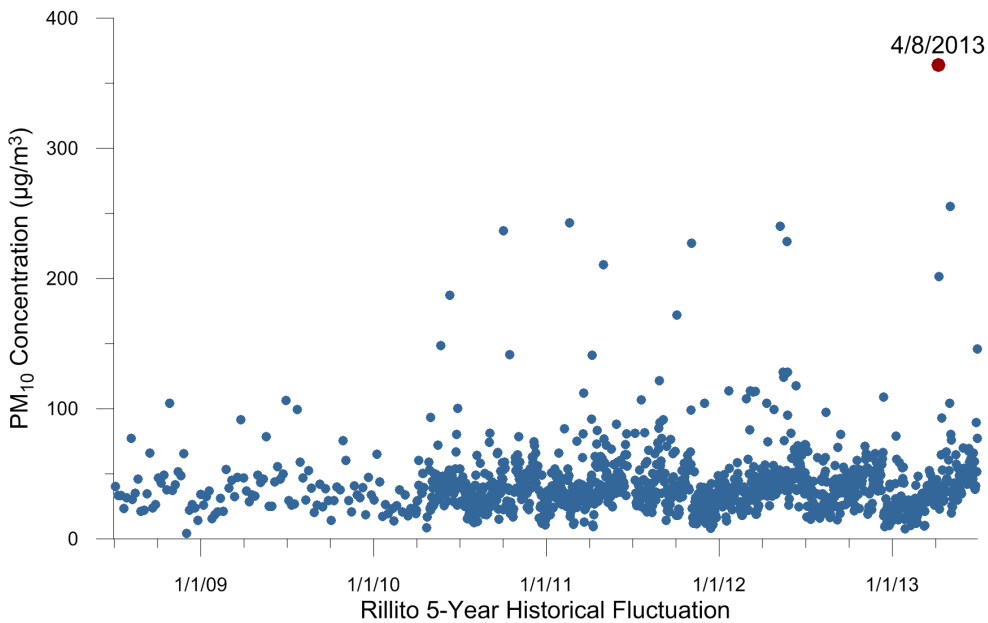

Figure C-29. 24-hr average PM_{10} concentrations at the Rillito monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red. Prior to April 1, 2010, the Rillito monitor operated on a one-in-six day schedule.

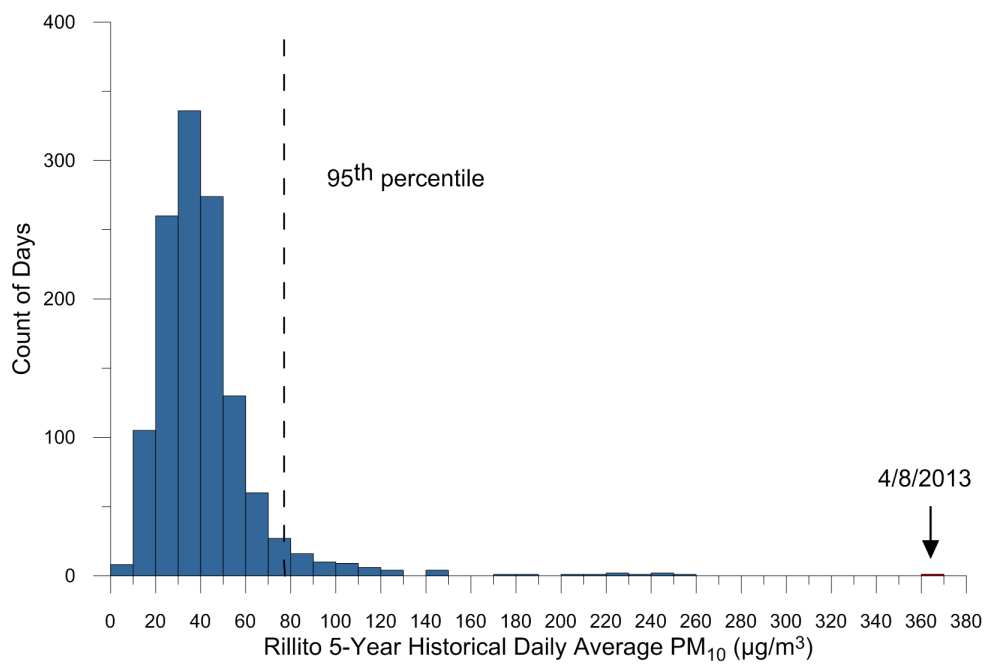

Figure C-30. 24-hr average PM_{10} concentrations at the Rillito monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over four times higher than the 95th percentile.

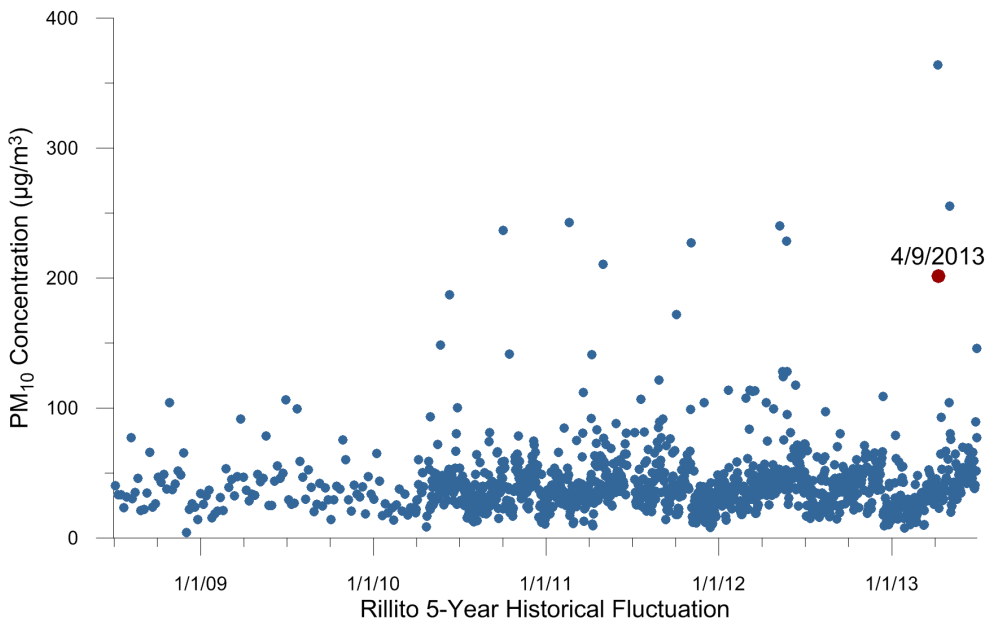

Figure C-31. 24-hr average PM_{10} concentrations at the Rillito monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 9, 2013, is red. Prior to April 1, 2010, the Rillito monitor operated on a one-in-six day schedule.

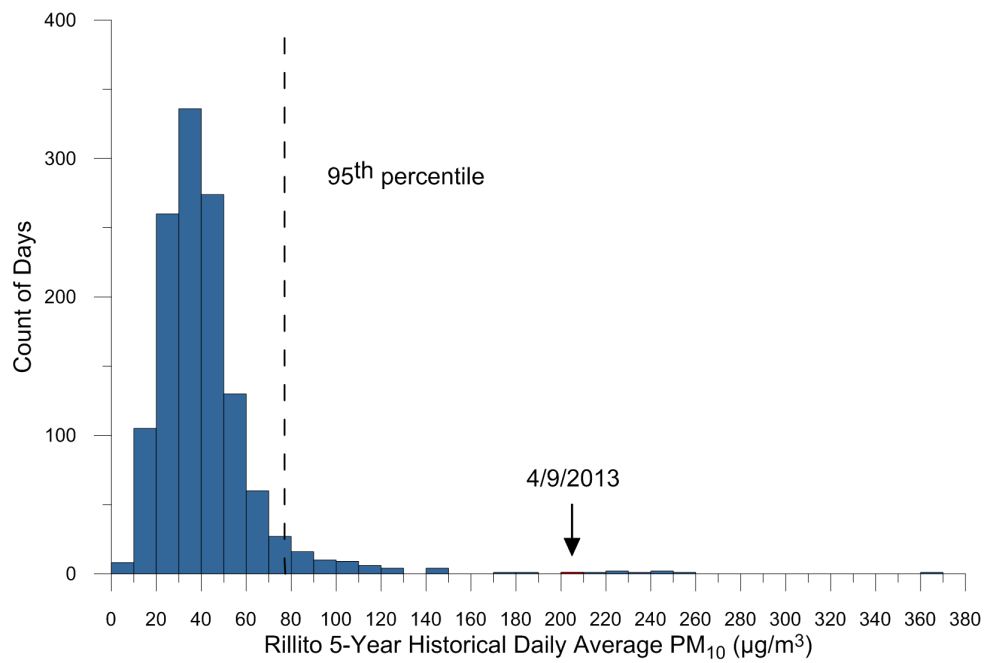

Figure C-32. 24-hr average PM_{10} concentrations at the Rillito monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 9, 2013, was over two times higher than the 95th percentile.

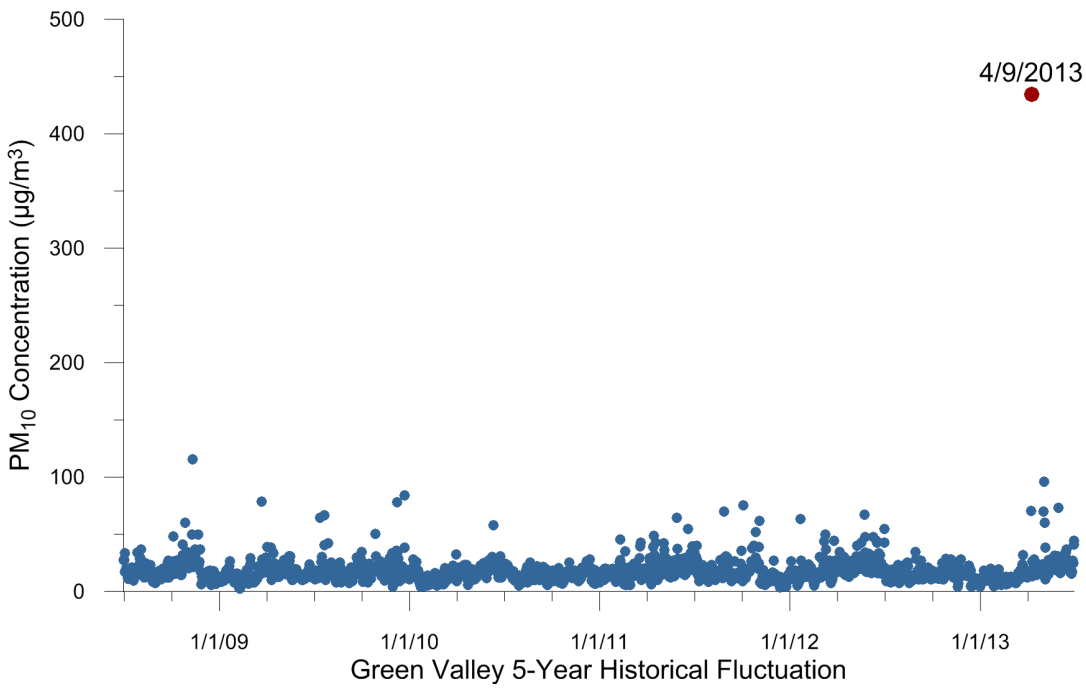

Figure C-33. 24-hr average PM_{10} concentrations at the Green Valley monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 9, 2013, is red.

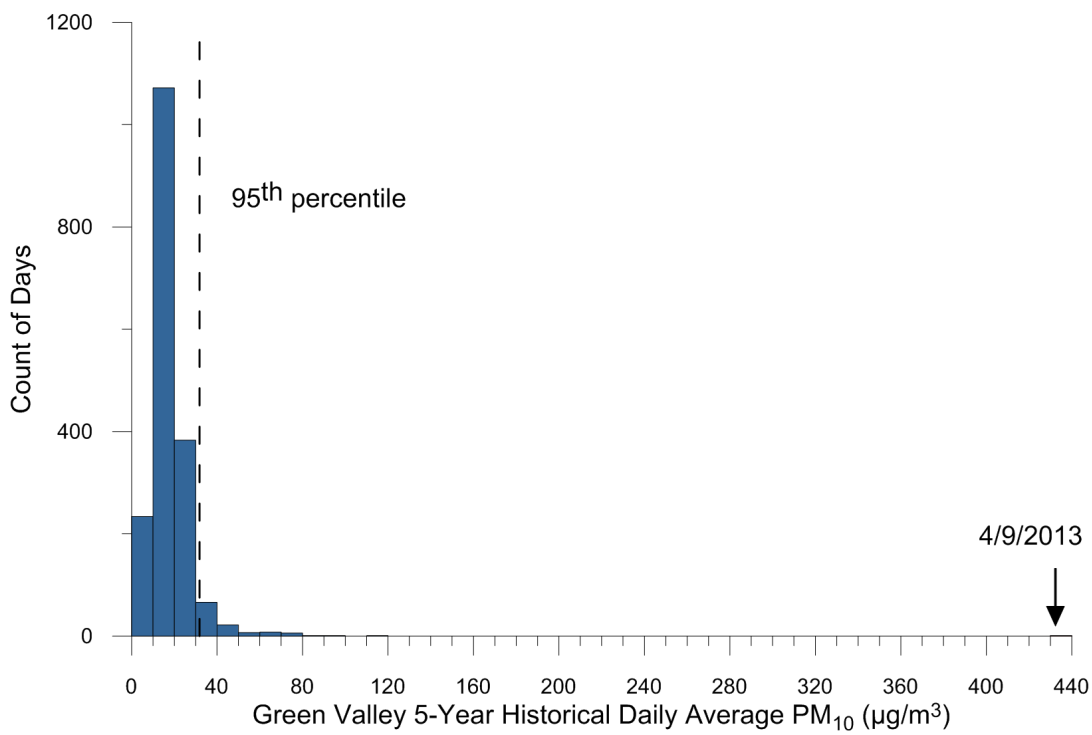

Figure C-34. 24-hr average PM_{10} concentrations at the Green Valley monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 9, 2013, was over ten times higher than the 95th percentile.

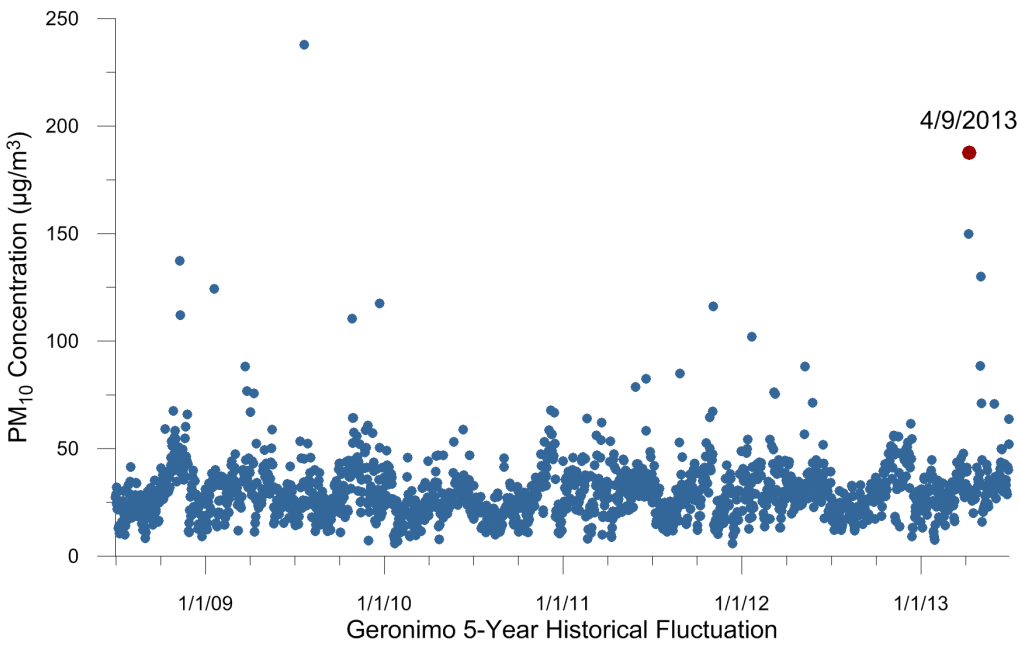

Figure C-35. 24-hr average PM_{10} concentrations at the Geronimo monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 9, 2013, is red.

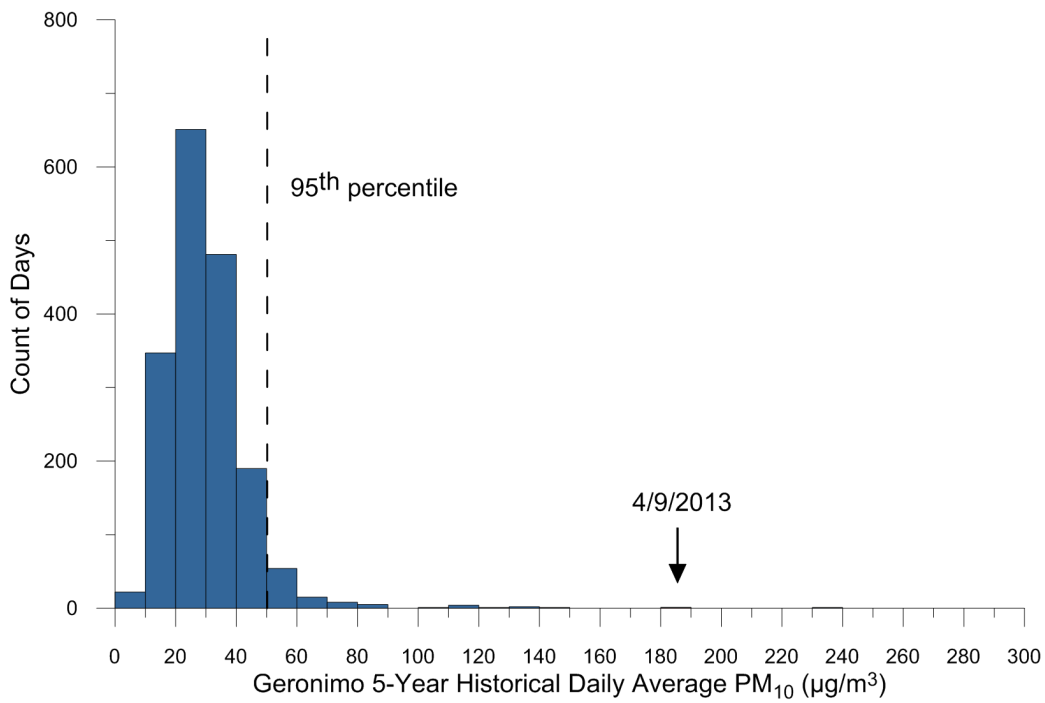

Figure C-36. 24-hr average PM_{10} concentrations at the Geronimo monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 9, 2013, was over three times higher than the 95th percentile.

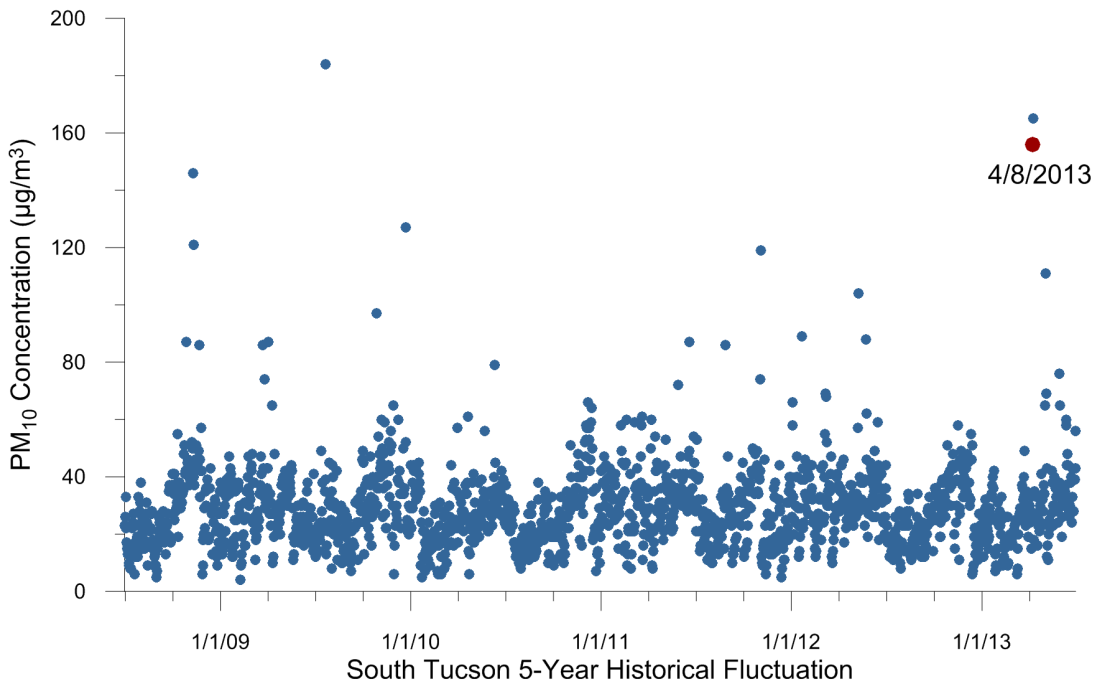

Figure C-37. 24-hr average PM_{10} concentrations at the South Tucson monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red.

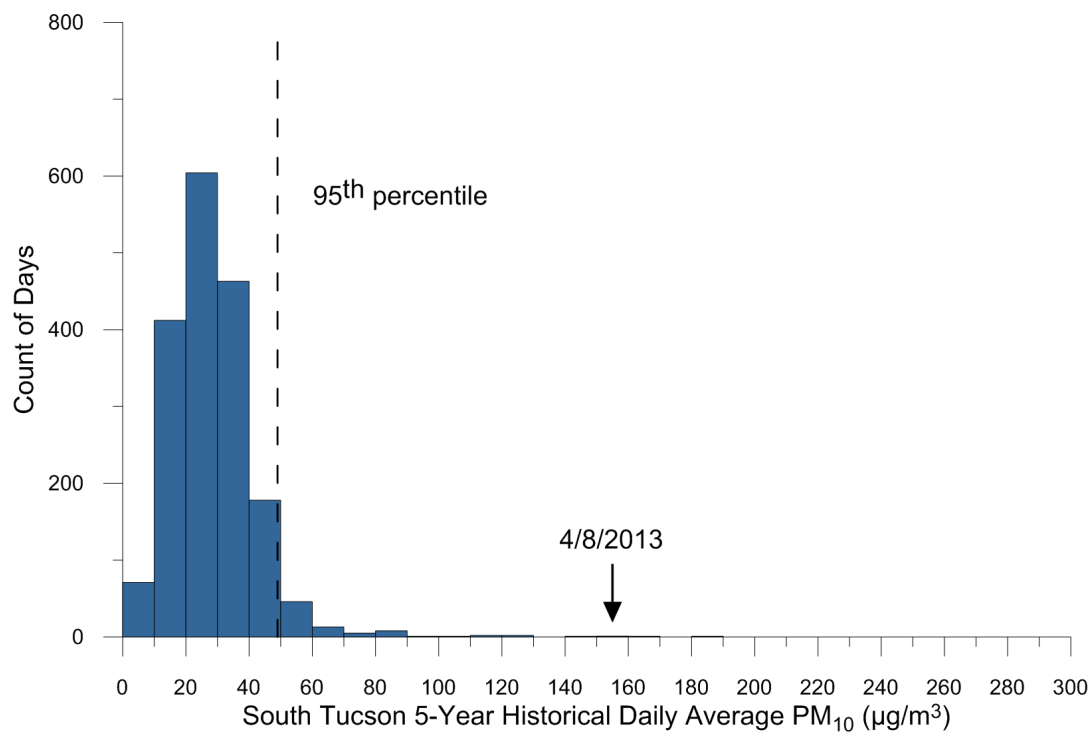

Figure C-38. 24-hr average PM_{10} concentrations at the South Tucson monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over three times higher than the 95th percentile.

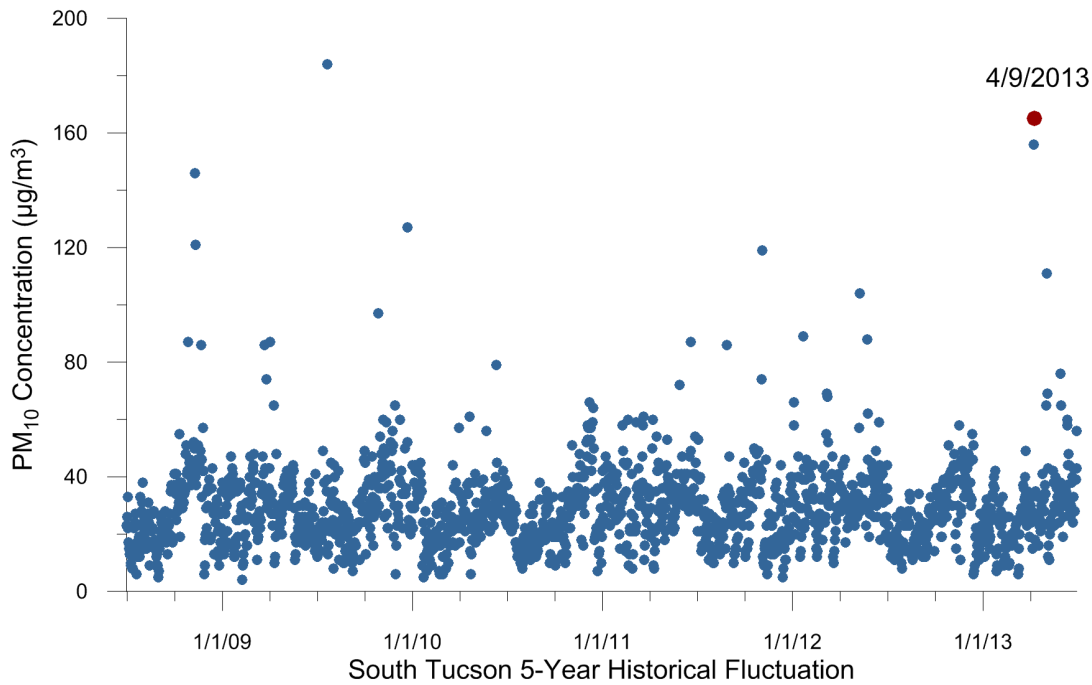

Figure C-39. 24-hr average PM_{10} concentrations at the South Tucson monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 9, 2013, is red.

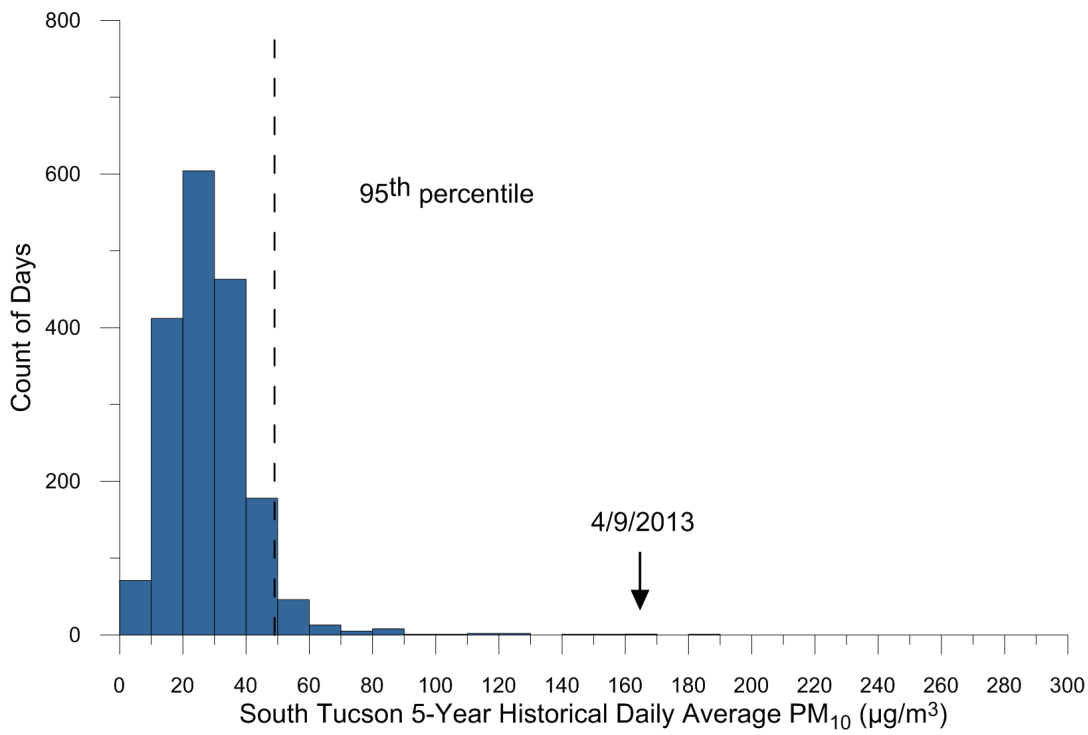

Figure C-40. 24-hr average PM_{10} concentrations at the South Tucson monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 9, 2013, was over three times higher than the 95th percentile.

Hayden and Miami

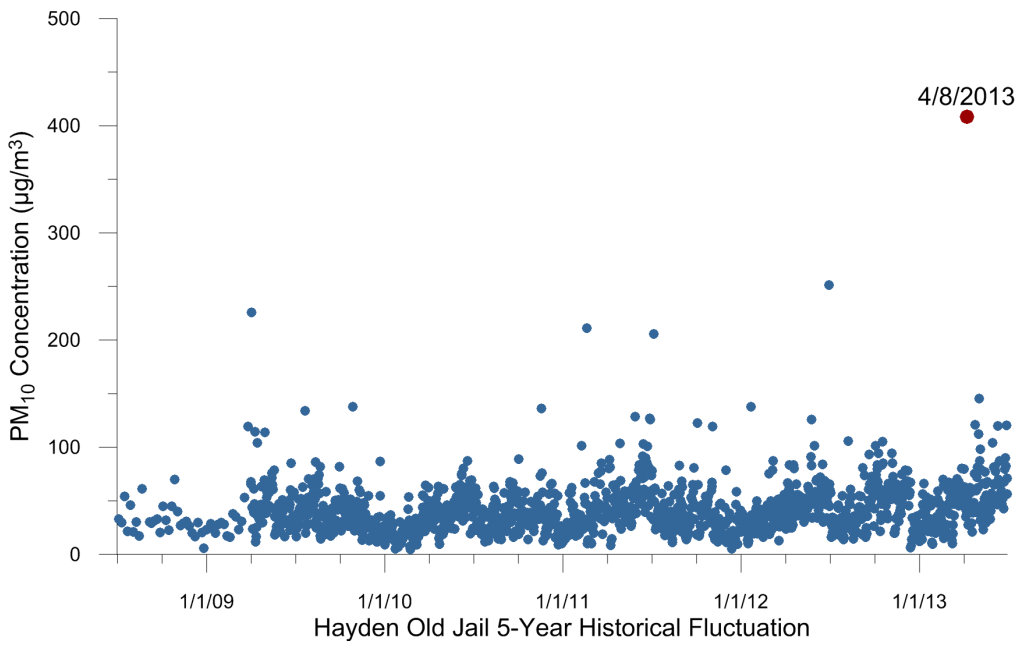

Figure C-41. 24-hr average PM_{10} concentrations at the Hayden Old Jail monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red. Prior to April 1, 2009, the Hayden monitor operated on a one-in-six day schedule.

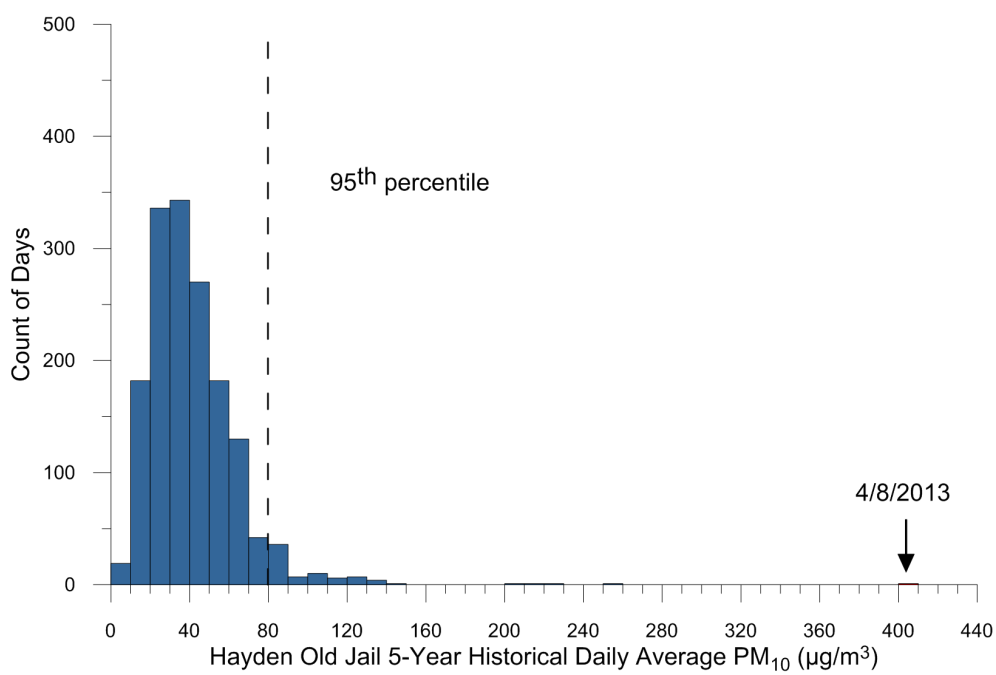

Figure C-42. 24-hr average PM_{10} concentrations at the Hayden Old Jail monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over five times higher than the 95th percentile.

Nogales

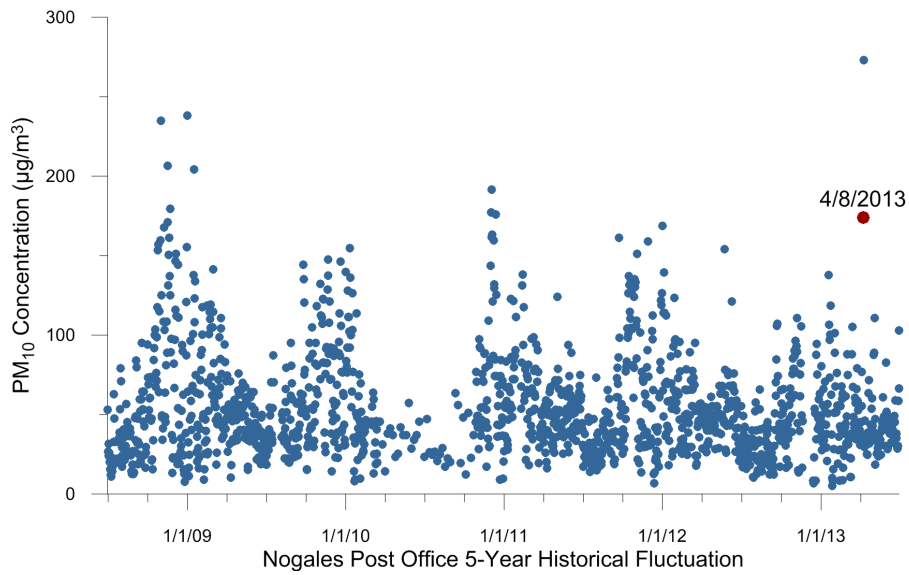

Figure C-43. 24-hr average PM_{10} concentrations at the Nogales Post Office monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red. Between March 16, 2010, and October 27, 2010, hourly PM_{10} concentrations collected at the Nogales Post Office monitor were flagged due to collection error, maintenance repairs, or poor quality assurance results. Here, we show 24-hr PM_{10} data collected on a one-in-six day schedule from a second Nogales Post Office monitor during this time period.

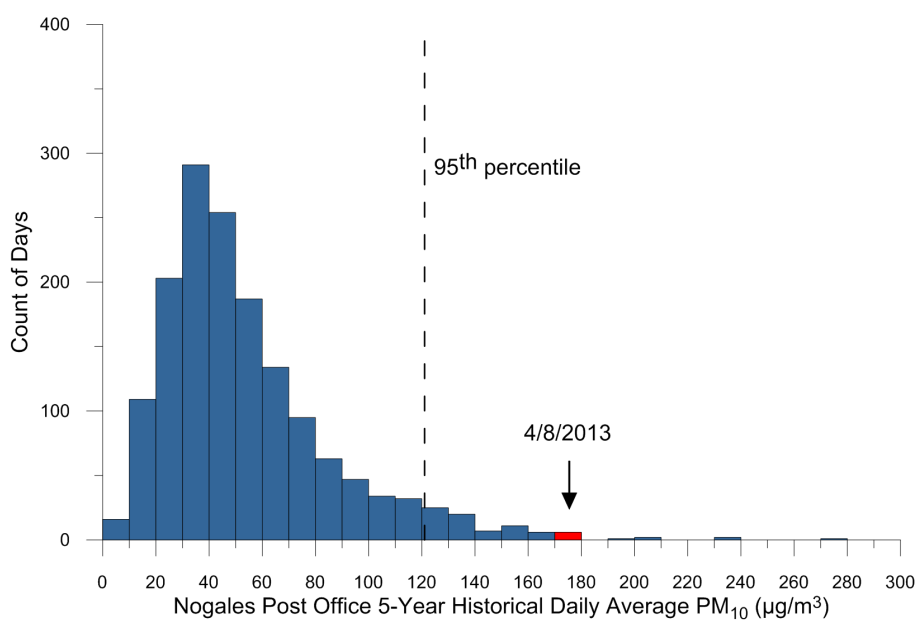

Figure C-44. 24-hr average PM_{10} concentrations at the Nogales Post Office monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, exceeded the 95th percentile.

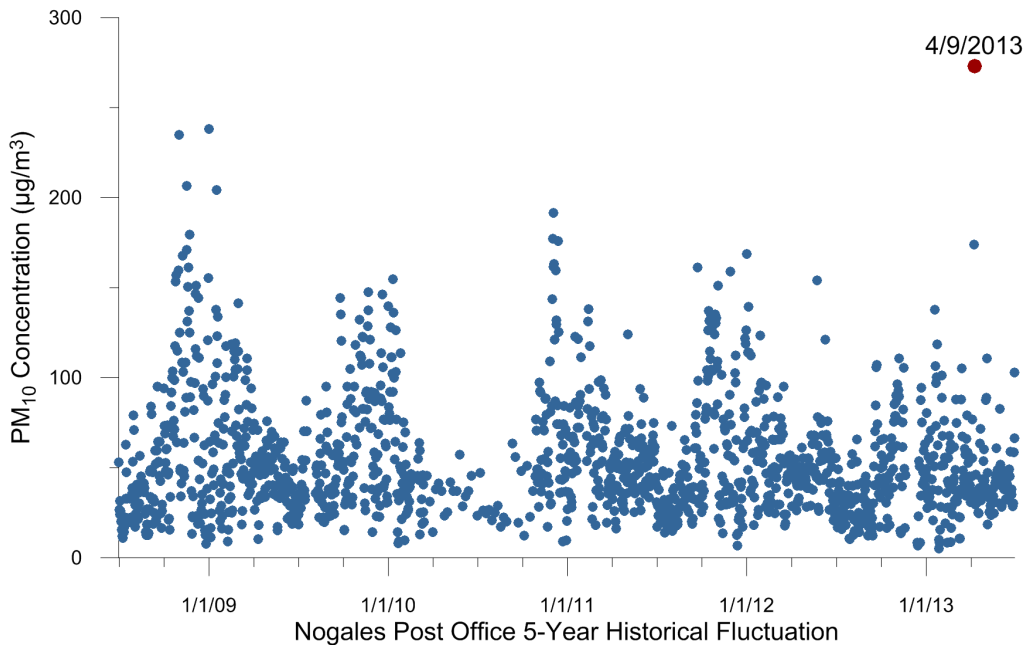

Figure C-45. 24-hr average PM_{10} concentrations at the Nogales Post Office monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 9, 2013, is red. Between March 16, 2010, and October 27, 2010, hourly PM_{10} concentrations collected at the Nogales Post Office monitor were flagged due to collection error, maintenance repairs, or poor quality assurance results. Here, we show 24-hr PM_{10} data collected on a one-in-six day schedule from a second Nogales Post Office monitor during this time period.

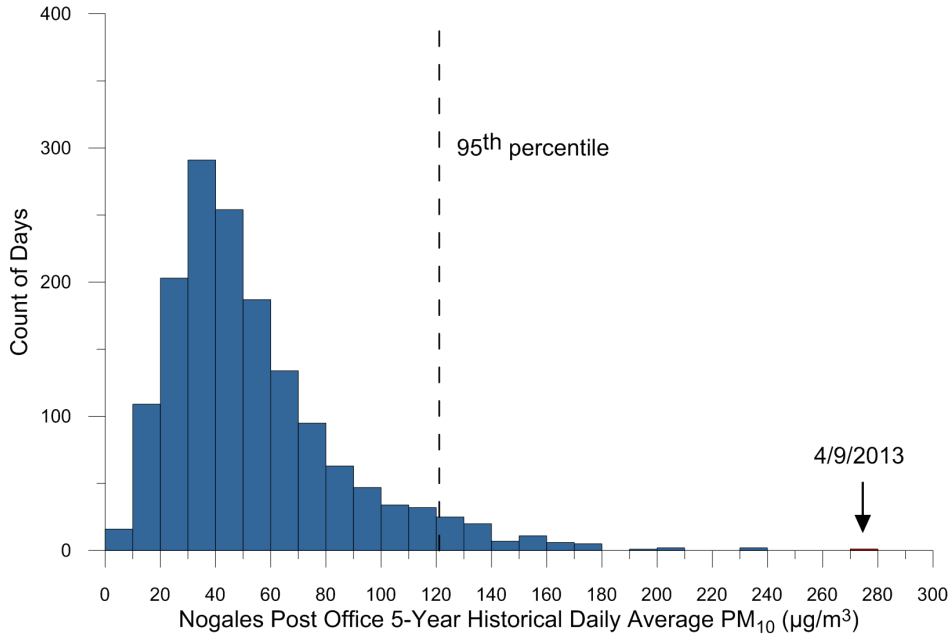

Figure C-46. 24-hr average PM_{10} concentrations at the Nogales Post Office monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 9, 2013, was over two times higher than the 95th percentile.

Douglas

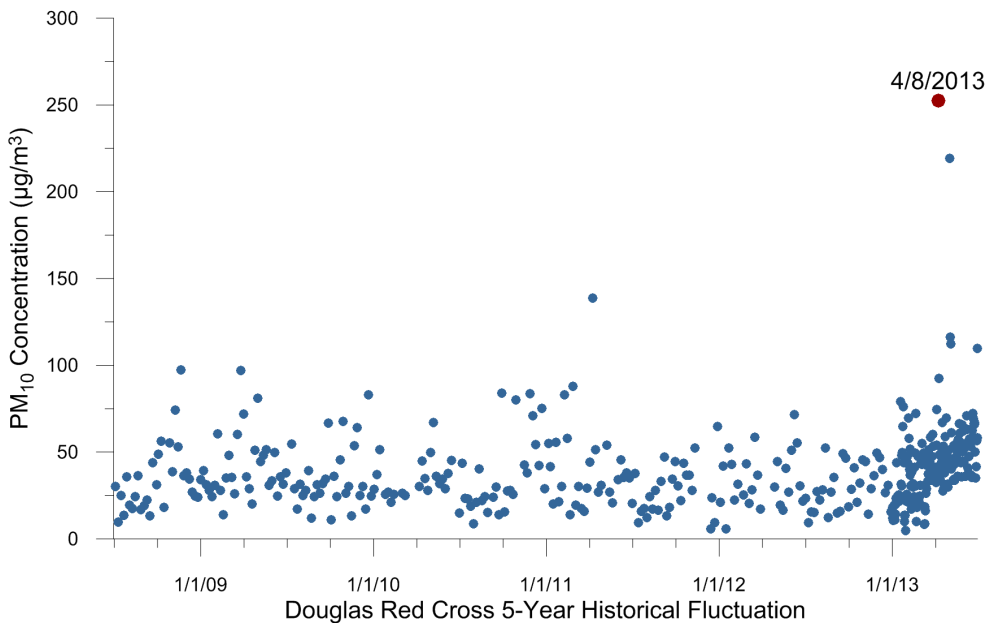

Figure C-47. 24-hr average PM_{10} concentrations at the Douglas Red Cross monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, is red. Prior to January 1, 2013, the Douglas Red Cross monitor operated on a one-in-six day schedule.

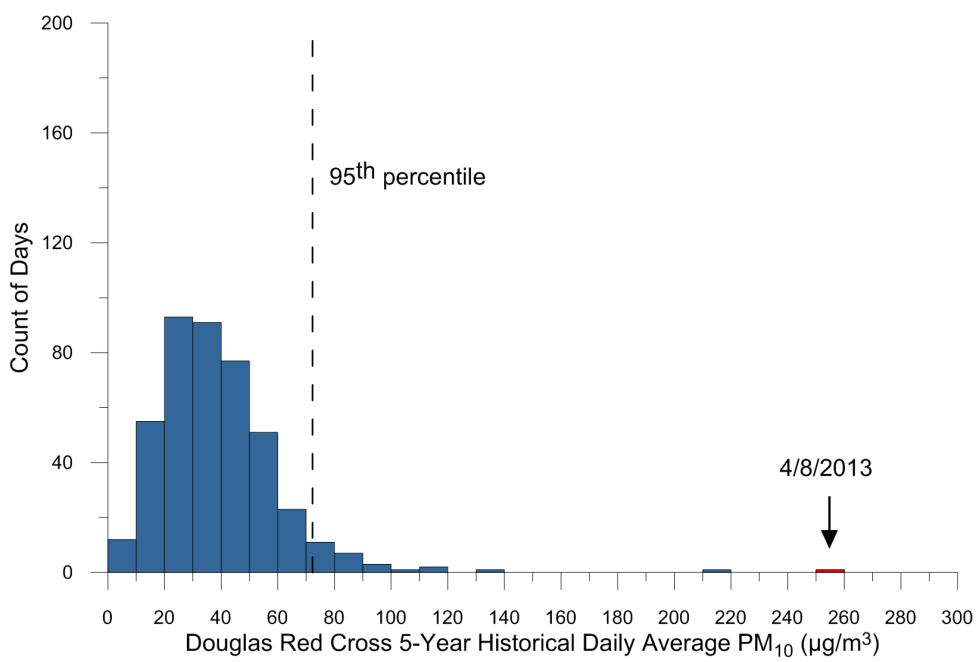

Figure C-48. 24-hr average PM_{10} concentrations at the Douglas Red Cross monitor for July 2008−July 2013. The 24-hr average PM_{10} concentration on April 8, 2013, was over three times higher than the 95th percentile.

Appendix D:
ADEQ and NWS Forecast Products

ADEQ
Arizona Department of Environmental Quality

AQI AIR QUALITY INDEX

200
150
100
50

VERY UNHEALTHY (201-300)

UNHEALTHY (151-200)

UNHEALTHY FOR SENSITIVE GROUPS (101-150)

MODERATE (51-100)

GOOD (0-50)

For more information visit:
http://www.airnow.gov/index.cfm?action=aqibasics.aqi

LINK TO 2012 AIR POLLUTION EXCEEDANCE GRAPH

AIR QUALITY FORECAST FOR Monday, April 8, 2013

This report is updated by 1:00 p.m. Sunday thru Friday and is valid
for areas within and bordering Maricopa County in Arizona

FORECAST DATE NOTICES (*SEE BELOW FOR DETAILS) AIR POLLUTANT	YESTERDAY Sat 04/06/2013 Highest AQI Reading/Site (*Preliminary data only*)	TODAY Sun 04/07/2013	TOMORROW Mon 04/08/2013 PM-10 HPA NWS Wind Advisory	EXTENDED Tue 04/09/2013 PM-10 Health Watch possible
O3*	71 Blue Point	71 *Moderate*	58 *Moderate*	48 *Good*
CO*	7 Greenwood	8 *Good*	6 *Good*	7 *Good*
PM-10*	39 Greenwood	47 *Good*	142 *Unhealthy for Sensitive Groups*	90 *Moderate*
PM-2.5*	30 North Phoenix	31 *Good*	74 *Moderate*	50 *Good*

* O3 = Ozone CO = Carbon Monoxide PM-10 = Particles 10 microns & smaller PM-2.5 = Particles smaller than 2.5 microns

*"Ozone Health Watch" means that the highest concentration of OZONE may approach the federal health standard.
"PM-10 or PM-2.5 Health Watch" means that the highest concentration of PM-10 or PM-2.5 may approach the federal health standard.
"High Pollution Advisory" means that the highest concentration of OZONE, PM-10, or PM-2.5 may exceed the federal health standard.
"DUST" means that short periods of high PM-10 concentrations caused by outflow from thunderstorms are possible.

Health Statements	
Sunday, 04/07/2013	Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.
Monday, 04/08/2013	Active children and adults and people with respiratory disease such as asthma should limit prolonged exertion outdoors.

SYNOPSIS AND DISCUSSION

A PM-10 HIGH POLLUTION ADVISORY HAS BEEN ISSUED FOR MONDAY APRIL 8, 2013

OZONE: Gusty winds - strong at times - and cooler daytime high temperatures are on tap for the Phoenix metro area Monday and Tuesday. Although low-levels winds will initially continue to be capable of transporting additional ozone and its precursors from California, this will end by late Monday. As a result local ozone levels are predicted to drop back into the good range Air Quality Index by Tuesday.

NOTE: Ozone production continues to become increasingly efficient due to several factors: day-length in the Phoenix metro area will increase from 12 hours and 33 minutes on April 01 to 13 hours and 32 minutes on May 01; and the peak sun angle for those two days will increase from 61.3 to 71.8 degrees, respectively.

PARTICLES: An intense, but rather dry upper level trough and surface cold front in the mid-latitude storm track will bring strong and gusty gradient winds to the entire region on Monday along with a slight chance for showers and thunderstorms in the Phoenix metro area on Monday. A lengthy period of strong and gusty winds on Monday as well as the potential for outflow from thunderstorms will contribute to a high risk for dense blowing and transported dust along with unhealthy PM-10 concentrations. Lingering suspended dust on Tuesday may pose a risk for elevated PM-10 levels so a moderate risk has been posted for now.

Check back tomorrow for more. Until then, have a good day! -C.Reith

MONITORING SITE MAPS	
STATIC MAP	http://www.azdeq.gov/environ/air/monitoring/images/map.jpg
INTERACTIVE MAPS	http://156.42.96.39/alert/Google/air.html http://www.airnow.gov/

ADEQ Arizona Department of Environmental Quality

MARICOPA COUNTY DUST CONTROL FORECAST

ISSUED Sunday, April 7, 2013

Three-day weather outlook:

An intense, but rather dry upper-level trough and surface cold front in the mid-latitude storm track will bring strong and gusty gradient winds to the entire region on Monday along with a slight chance for showers and thunderstorms in the Phoenix metro area on Monday. A lengthy period of strong and gusty winds on Monday as well as the potential for outflow from thunderstorms will contribute to a HIGH risk for dense blowing and transported dust along with unhealthy PM-10 concentrations. Lingering suspended dust on Tuesday may pose a risk for elevated PM-10 levels so a moderate risk has been posted for now.

R I S K F A C T O R S

	WINDS		STAGNATION		UNHEALTHY PM-10 RISK LEVEL
Day 1: Mon. 4/8/2013	South-southwest winds between 10-20 mph are expected early, becoming 25-35 mph with gusts near 45 mph at times.	+	Little if any stagnation expected.	=	HIGH
Day 2: Tue. 4/9/2013	West to northwesterly 10-20 mph.	+	Little if any stagnation expected.	=	MODERATE
Day 3: Wed. 4/10/2013	Northeasterly 10-20 mph morning hours becoming northwesterly during the afternoon.	+	Little if any stagnation expected.	=	LOW
EXTENDED OUTLOOK					
Day 4: Thu. 4/11/2013	West to northwesterly 10-20 mph.	+	Rather stagnant during the morning hours.	=	LOW
Day 5: Fri. 4/12/2013	Mostly <10 mph.	+	Rather stagnant during the morning hours.	=	LOW

The Maricopa County Dust Control Action Forecast is issued to assist in the planning of work activities to help reduce dust pollution. A recorded message of this forecast can be accessed at 602-771-2368. To review the complete air quality forecast for the Phoenix metropolitan area, as well as the health impacts and reduction methods for different air pollutants, call 602-771-2367 for recorded forecast information or click on ADEQ's Air Quality Forecast at http://www.azdeq.gov/environ/air/ozone/ensemble.pdf.

ADEQ
Arizona Department of Environmental Quality

AQI AIR QUALITY INDEX

200
150
100
50

VERY UNHEALTHY (201-300)

UNHEALTHY (151-200)

UNHEALTHY FOR SENSITIVE GROUPS (101-150)

MODERATE (51-100)

GOOD (0-50)

For more information visit:
http://www.airnow.gov/index.cfm?action=aqibasics.aqi

LINK TO 2012 AIR POLLUTION EXCEEDANCE GRAPH

AIR QUALITY FORECAST FOR Tuesday, April 9, 2013

This report is updated by 1:00 p.m. Sunday thru Friday and is valid
for areas within and bordering Maricopa County in Arizona

FORECAST DATE NOTICES (*SEE BELOW FOR DETAILS) AIR POLLUTANT	YESTERDAY Sun 04/07/2013 Highest AQI Reading/Site (*Preliminary data only*)	TODAY Mon 04/08/2013 PM-10 HPA NWS Wind Advisory	TOMORROW Tue 04/09/2013 PM-10 Health Watch	EXTENDED Wed 04/10/2013
O3*	64 Blue Point & Tonto Nat'l Mon.	58 *Moderate*	45 *Good*	48 *Good*
CO*	9 Phoenix Supersite	6 *Good*	7 *Good*	7 *Good*
PM-10*	38 Central Phoenix	142 *Unhealthy for Sensitive Groups*	90 *Moderate*	53 *Moderate*
PM-2.5*	34 Tempe	74 *Moderate*	52 *Moderate*	37 *Good*

* O3 = Ozone CO = Carbon Monoxide PM-10 = Particles 10 microns & smaller PM-2.5 = Particles smaller than 2.5 microns

*"Ozone Health Watch" means that the highest concentration of OZONE may approach the federal health standard.
"PM-10 or PM-2.5 Health Watch" means that the highest concentration of PM-10 or PM-2.5 may approach the federal health standard.
"High Pollution Advisory" means that the highest concentration of OZONE, PM-10, or PM-2.5 may exceed the federal health standard.
"DUST" means that short periods of high PM-10 concentrations caused by outflow from thunderstorms are possible.

Health Statements	
Monday, 04/08/2013	Active children and adults and people with respiratory disease such as asthma should limit prolonged exertion outdoors.
Tuesday, 04/09/2013	Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.

SYNOPSIS AND DISCUSSION

A PM-10 HIGH POLLUTION ADVISORY REMAINS IN EFFECT THROUGH MIDNIGHT
A PM-10 HEALTH WATCH HAS BEEN ISSUED FOR TUESDAY APRIL 9, 2012

OZONE: As one would expect under the current weather conditions, as of noon local hourly ozone readings are running well below those of 24 hours ago. Breezy winds and below average daytime high temperatures - along with some cloud cover - should help keep Valley ozone concentrations reigned in for the next few days.

NOTE: Ozone production continues to become increasingly efficient due to several factors: day-length in the Phoenix metro area will increase from 12 hours and 33 minutes on April 01 to 13 hours and 32 minutes on May 01; and the peak sun angle for those two days will increase from 61.3 to 71.8 degrees, respectively.

PARTICLES: An intense, but rather dry upper-level trough and surface cold front in the mid-latitude storm track has brought strong and gusty gradient winds to the region today along with a slight chance for showers and thunderstorms. As of 12:30 p.m. the highest reported wind gust locally so far has been 40 mph, the lowest reported visibility 1/2 mile, and the highest instantaneous PM-10 (coarse particle) concentration 1,998ug/m3 at the West Forty Third monitoring site. Gradient winds will remain rather breezy on Tuesday and, along with the likelihood of lingering dust from today's big wind event, may keep PM-10 concentrations near unhealthy levels; a PM-10 Health Watch has been issued to allow for this possibility. The aforementioned system will begin to exit the area by late Wednesday as a ridge aloft approaches from the west.

Check back tomorrow for the latest. Until then, have a good day! -C.Reith

MONITORING SITE MAPS	
STATIC MAP	http://www.azdeq.gov/environ/air/monitoring/images/map.jpg
INTERACTIVE MAPS	http://156.42.96.39/alert/Google/air.html http://www.airnow.gov/

ADEQ Arizona Department of Environmental Quality

MARICOPA COUNTY DUST CONTROL FORECAST

ISSUED Monday, April 8, 2013

Three-day weather outlook:

An intense, but rather dry upper level trough and surface cold front in the mid-latitude storm track has brought strong and gusty gradient winds to the region today along with a slight chance for showers and thunderstorms. Gradient winds will remain rather breezy on Tuesday and, along with the likelihood of lingering dust from today's big wind event, should keep the unhealthy PM-10 risk elevated. The aforementioned system will begin to exit the area by late Wednesday as a ridge aloft approaches from the west. Winds will become mostly light by Friday.

R I S K F A C T O R S

	WINDS		STAGNATION		UNHEALTHY PM-10 RISK LEVEL
Day 1: Tue. 4/9/2013	Westerly 10-20 mph with higher gusts possible.	+	Little if any stagnation expected.	=	MODERATE
Day 2: Wed. 4/10/2013	West to northwesterly 10-20 mph.	+	Little if any stagnation expected.	=	LOW
Day 3: Thu. 4/11/2013	Northeasterly 10-20 mph morning hours becoming northwesterly <15 mph during the afternoon.	+	Increasing stagnation during the evening hours.	=	LOW
EXTENDED OUTLOOK					
Day 4: Fri. 4/12/2013	Mostly <10 mph.	+	Rather stagnant during the morning hours.	=	LOW
Day 5: Sat. 4/13/2013	Mostly <10 mph.	+	Rather stagnant during the morning hours.	=	LOW

The Maricopa County Dust Control Action Forecast is issued to assist in the planning of work activities to help reduce dust pollution. A recorded message of this forecast can be accessed at 602-771-2368. To review the complete air quality forecast for the Phoenix metropolitan area, as well as the health impacts and reduction methods for different air pollutants, call 602-771-2367 for recorded forecast information or click on ADEQ's Air Quality Forecast at http://www.azdeq.gov/environ/air/ozone/ensemble.pdf.

ADEQ
Arizona Department of Environmental Quality

GREEN VALLEY AND VICINITY
DUST RE-ENTRAINMENT RISK WIND FORECAST

ISSUED Sunday, April 7, 2013

Three-day weather outlook:

An intense, but rather dry upper-level trough and surface cold front in the mid-latitude storm track will bring strong and gusty gradient winds to the region on Monday along with a slight chance for showers and thunderstorms Monday and Tuesday. This will contribute to a high risk for re-entrained dust on Monday and a moderate risk on Tuesday - the latter mainly due to the potential for outflow winds from thunderstorms.

	WINDS	RE-ENTRAINMENT RISK
Day 1: Mon. 4/8/2013	South to southwesterly 25-35 mph with gusts near 50 mph possible during the afternoon.	HIGH
Day 2: Tue. 4/9/2013	Westerly 15-25 mph except strong and gusty due to outflow from thunderstorms.	MODERATE
Day 3: Wed. 4/10/2013	No significant winds expected.	LOW

PM-10 & PM-2.5 (PARTICLES)

PM-10 (COARSE PARTICLES):

Description – The term "particulate matter" (PM) includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. Particles less than 10 micrometers in diameter tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system. Particles with diameters between 2.5 and 10 micrometers are referred to as "coarse".

Potential health impacts – PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis.

Exposure reduction measures – During high-wind or other events that prompt a forecasted MODERATE or HIGH risk of transported dust over the Green Valley area, sensitive persons should remain indoors and close windows and doors.

Units of measurement – Micrograms per cubic meter (ug/m3).

JRP 04/29/2011

ADEQ
Arizona Department of Environmental Quality

GREEN VALLEY AND VICINITY
DUST RE-ENTRAINMENT RISK WIND FORECAST

ISSUED Monday, April 8, 2013

Three-day weather outlook:

An intense, but rather dry upper-level trough and surface cold front in the mid-latitude storm track has brought strong and gusty gradient winds to the region today along with a slight chance for showers and thunderstorms. Gradient winds will remain rather gusty on Tuesday and, along with the slight chance for outflow from thunderstorms, will keep the re-entrained dust risk elevated. Much less wind is forecast beginning on Wednesday.

	WINDS	RE-ENTRAINMENT RISK
Day 1: Tue. 4/9/2013	Westerly 15-25 mph except strong and gusty due to outflow from thunderstorms.	MODERATE
Day 2: Wed. 4/10/2013	No significant winds expected.	LOW
Day 3: Thu. 4/11/2013	No significant winds expected.	LOW

PM-10 & PM-2.5 (PARTICLES)

PM-10 (COARSE PARTICLES):

Description – The term "particulate matter" (PM) includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. Particles less than 10 micrometers in diameter tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system. Particles with diameters between 2.5 and 10 micrometers are referred to as "coarse".

Potential health impacts – PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis.

Exposure reduction measures – During high-wind or other events that prompt a forecasted MODERATE or HIGH risk of transported dust over the Green Valley area, sensitive persons should remain indoors and close windows and doors.

Units of measurement – Micrograms per cubic meter (ug/m3).

JRP 04/29/2011

National Weather Service Phoenix Forecast Products

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE PHOENIX AZ
900 PM MST SUN APR 7 2013

.SYNOPSIS...A STRONG PACIFIC STORM SYSTEM WILL AFFECT THE AREA MONDAY AND TUESDAY...WITH A BRIEF COOLING TREND THROUGH THE MIDDLE OF THE WEEK. WEST WINDS WILL INCREASE MARKEDLY MONDAY AFTERNOON WITH GUSTS ABOVE 40 MPH FOR THE ENTIRE AREA. A SLIGHT CHANCE OF SHOWERS AND POTENTIALLY A THUNDERSTORM IS ALSO POSSIBLE IN SOUTH CENTRAL ARIZONA...FOCUSED PRIMARILY OVER THE HIGHER TERRAIN NORTH AND EAST OF PHOENIX. DRY WEATHER AND WARMER TEMPERATURES WILL RETURN BY THE END OF THE WEEK.

&&

.DISCUSSION...SO FAR THIS EVENING...AZ RAOBS AND PLOT DATA INDICATED DRY WESTERLY FLOW ALOFT AHEAD OF A DEEP AND COLD PACIFIC LOW PRESSURE SYSTEM WHICH HAS BEEN DEVELOPING ALONG THE PAC NW/NRN CA COAST. H5 TEMPS NEAR THE CORE OF THE LOW WERE BELOW MINUS 30C...AND THIS SYSTEM WILL BRING VERY STRONG WIND...BLOWING DUST...MUCH COOLER TEMPS AND A THREAT FOR SHOWERS OR A THUNDERSTORM TO THE DESERTS ON MONDAY AS THE COLD FRONT RAPIDLY PUSHES EAST ACROSS THE AREA. AT 8 PM IR IMAGERY SHOWED A BAND OF HIGH CLOUDS RAPIDLY MOVING EAST ACROSS AZ...AHEAD OF THE DEVELOPING UPPER LOW WITH CLEARING ALREADY OCCURRING OVER SERN CA. FOR THE REST OF TONIGHT PROGS INDICATE THAT THE LOW WILL DIG TO THE SOUTHEAST THRU NRN CA AND WESTERN NEVADA AIDED BY A 140KT UPPER JET DIVING DOWN THE BACKSIDE OF THE LOW ALONG THE NRN CA COAST. AS THIS OCCURS LOW/MID LEVEL GRADIENTS WILL STEADILY TIGHTEN ACROSS SERN CA AND ARIZONA...LEADING TO INCREASED WIND OVERNIGHT MAINLY WEST OF THE LOWER CO RIVER VALLEY. COLD FRONT WILL BEGIN TO MOVE INTO THE SERN CA ZONES LATER TONIGHT LEADING TO WINDY CONDITIONS ALONG WITH SOME INCREASE IN MID/HI CLOUD COVER...ALTHOUGH NO PRECIP IS EXPECTED TO OCCUR DUE TO THE DRY LOW LEVELS OF THE ATMOSPHERE.

GIVEN THE STRENGTH OF THE WINDS THAT THE MODELS ARE CALLING FOR TOMORROW AS THE FRONT MOVES OVER THE LOWER DESERTS...GUIDANCE FROM THE PAST SEVERAL MOS PACKAGES CONSISTENTLY HAS CALLED FOR SUSTAINED SPEEDS IN EXCESS OF 35KT...POSSIBILITY EXISTS FOR SOME DENSE BLOWING DUST TO OCCUR OVER THE DESERTS. MID SHIFT MAY WANT TO CONSIDER ISSUING A BLOWING DUST ADVISORY FOR MUCH OF THE DESERTS MONDAY.

CURRENT FORECASTS LOOK TO BE IN GOOD SHAPE AND NO UPDATES ARE NEEDED.

ZONE FORECASTS FOR SOUTHWEST ARIZONA/SOUTHEAST CALIFORNIA
NATIONAL WEATHER SERVICE PHOENIX AZ
313 AM MST MON APR 8 2013

AZZ023-082315-
GREATER PHOENIX AREA-
INCLUDING...BUCKEYE...CAREFREE...CAVE CREEK...CHANDLER...
FOUNTAIN HILLS...GILBERT...GLENDALE...MESA...PEORIA...PHOENIX...
SCOTTSDALE...SUN CITY...AND TEMPE

313 AM MST MON APR 8 2013

...WIND ADVISORY IN EFFECT FROM 10 AM THIS MORNING TO 8 PM MST THIS EVENING...

.TODAY...MOSTLY SUNNY WITH A SLIGHT CHANCE OF SHOWERS IN THE MORNING...THEN PARTLY SUNNY WITH A SLIGHT CHANCE OF AFTERNOON SHOWERS AND THUNDERSTORMS. AREAS OF BLOWING DUST IN THE AFTERNOON. WINDY. NOT AS WARM. HIGHS 75 TO 80. SOUTHWEST WIND 20 TO 35 MPH. GUSTS UP TO 45 MPH IN THE MORNING INCREASING TO 50 MPH IN THE AFTERNOON. CHANCE OF MEASURABLE RAIN 20 PERCENT.
.TONIGHT...PARTLY CLOUDY. AREAS OF BLOWING DUST IN THE EVENING. A SLIGHT CHANCE OF SHOWERS AND THUNDERSTORMS IN THE EVENING...THEN A SLIGHT CHANCE OF SHOWERS AFTER MIDNIGHT. WINDY AND MUCH COOLER. LOWS 44 TO 54. WEST WIND 20 TO 30 MPH IN THE EVENING BECOMING SOUTHWEST 10 TO 15 MPH AFTER MIDNIGHT. GUSTS UP TO 45 MPH IN THE EVENING. CHANCE OF MEASURABLE RAIN 10 PERCENT.
.TUESDAY...PARTLY CLOUDY...BREEZY AND COOLER. HIGHS 68 TO 73. SOUTHWEST WIND 5 TO 10 MPH IN THE MORNING BECOMING WEST 10 TO 20 MPH IN THE AFTERNOON. GUSTS UP TO 30 MPH IN THE AFTERNOON.
.TUESDAY NIGHT...PARTLY CLOUDY IN THE EVENING...THEN BECOMING CLEAR. LOWS 44 TO 54. NORTHWEST WIND 10 TO 20 MPH IN THE EVENING BECOMING NORTH 10 TO 15 MPH AFTER MIDNIGHT.
.WEDNESDAY...SUNNY AND WARMER. HIGHS 73 TO 78. NORTH WIND 5 TO 15 MPH.
.WEDNESDAY NIGHT AND THURSDAY...CLEAR AND WARMER. LOWS IN THE MID 40S TO MID 50S. HIGHS IN THE LOWER TO MID 80S.
.THURSDAY NIGHT...MOSTLY CLEAR. NOT AS COOL. LOWS 50 TO 60.
.FRIDAY AND FRIDAY NIGHT...CLEAR. LOWS 50 TO 60. HIGHS IN THE MID TO UPPER 80S.
.SATURDAY THROUGH SUNDAY...MOSTLY CLEAR. LOWS 50 TO 60. HIGHS IN THE MID 80S TO LOWER 90S.

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AZZ025-082315-
YUMA/MARTINEZ LAKE AND VICINITY-
INCLUDING...FORTUNA FOOTHILLS...SAN LUIS...SOMERTON...AND YUMA
313 AM MST MON APR 8 2013

...WIND ADVISORY IN EFFECT FROM 10 AM THIS MORNING TO 8 PM MST THIS EVENING...

.TODAY...SUNNY AND WINDY. AREAS OF BLOWING DUST IN THE AFTERNOON. MUCH COOLER. HIGHS NEAR 78. WEST WIND 20 TO 35 MPH. GUSTS UP TO 40 MPH IN THE MORNING INCREASING TO 50 MPH IN THE AFTERNOON.
.TONIGHT...CLEAR AND WINDY. AREAS OF BLOWING DUST IN THE EVENING. MUCH COOLER. LOWS 48 TO 52. WEST WIND 20 TO 30 MPH IN THE EVENING DECREASING TO 10 TO 15 MPH AFTER MIDNIGHT. GUSTS UP TO 45 MPH IN THE EVENING.
.TUESDAY...SUNNY AND BREEZY. HIGHS NEAR 79. NORTHWEST WIND 10 TO 20 MPH. GUSTS UP TO 30 MPH IN THE AFTERNOON.
.TUESDAY NIGHT...CLEAR. NOT AS COOL. LOWS 53 TO 57. NORTHWEST WIND 10 TO 15 MPH.
.WEDNESDAY...SUNNY AND BREEZY. HIGHS NEAR 83. NORTH WIND 15 TO 20 MPH. GUSTS UP TO 30 MPH.
.WEDNESDAY NIGHT THROUGH SATURDAY NIGHT...CLEAR AND WARMER. LOWS IN

THE MID TO UPPER 50S. HIGHS AROUND 90.
.SUNDAY...MOSTLY SUNNY. HIGHS IN THE LOWER 90S.

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE PHOENIX AZ
320 AM MST MON APR 8 2013

.SYNOPSIS...A STRONG PACIFIC STORM SYSTEM WILL AFFECT THE AREA THROUGH TUESDAY...WITH A BRIEF COOLING TREND THROUGH THE MIDDLE OF THE WEEK. VERY WINDY CONDITIONS ARE EXPECTED TODAY WITH GUSTS ABOVE 40 MPH FOR THE ENTIRE AREA. A SLIGHT CHANCE OF SHOWERS AND POTENTIALLY A THUNDERSTORM IS ALSO POSSIBLE IN SOUTH CENTRAL ARIZONA...FOCUSED PRIMARILY OVER THE HIGHER TERRAIN NORTH AND EAST OF PHOENIX. DRY WEATHER AND WARMER TEMPERATURES WILL RETURN BY THE END OF THE WEEK.

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.DISCUSSION...LOW PRESSURE CONTINUES TO INTENSIFY ACROSS CA/NV EARLY THIS MORNING. PREFRONTAL WINDS HAVE ALREADY GUSTED TO 35 KT IN THE IMPERIAL VALLEY AND UP TO 40 KT ACROSS THE MOJAVE DESERT AND NEAR LAS VEGAS...WHICH PORTENDS AN ACTIVE DAY ACROSS OUR FORECAST AREA. CYCLOGENESIS WILL TAKE PLACE NEAR NV/UT TODAY...WITH A BONAFIDE SURFACE COLD FRONT MOVING EASTWARD THROUGH CA/AZ.

MAIN IMPACT OF THIS SYSTEM WILL BE THE VERY WINDY CONDITIONS. MODELS CONTINUE TO INDICATE THAT EFFICIENT MIXING THROUGH 8-10K FT WILL YIELD WIND GUSTS AS HIGH AS 45 MPH IN THE PHOENIX AREA AND PERHAPS AS HIGH AS 50 MPH IN THE VICINITY OF THE LOW-LEVEL JET ACROSS THE DUST-PRONE AREAS OF PINAL COUNTY INCLUDING CASA GRANDE AND THE HIGHER ELEVATIONS OF SOUTHERN GILA COUNTY. JUST TO PROVIDE SOME CONTEXT...NAEFS STANDARDIZED ANOMALIES ARE AS HIGH AS 4-5 AT 850 MB AROUND 18Z...INDICATING THAT WINDS OF THIS MAGNITUDE HAVE NOT OCCURRED THIS TIME OF YEAR AT 18Z AT LEAST THROUGH THE CFSR PERIOD DATING BACK TO 1979. WIND ADVISORIES CONTINUE AREA-WIDE WITH DENSE BLOWING DUST EXPECTED. MODELS IN GOOD AGREEMENT THAT WINDS WILL ABATE SOMEWHAT THIS EVENING BEHIND THE FRONTAL BOUNDARY.

STRONG VORTICITY AND JET-FORCED ASCENT WILL MAKE THE MOST OF THE MOISTURE THAT EXISTS ACROSS THE AREA...GENERALLY AROUND 0.5 INCHES OF PWAT PER THE LATEST GROUND-BASED PHOENIX SOUNDER. LATEST HI-RES GUIDANCE INDICATES THAT SHOWERS WILL DEVELOP ALONG THE COLD FRONT EARLY THIS AFTERNOON ACROSS NORTH-CENTRAL ARIZONA BEFORE SPREADING FURTHER SOUTH TOWARDS PHOENIX DURING THE LATE AFTERNOON. BEST PRECIPITATION CHANCES WILL BE FOCUSED ACROSS THE HIGHER TERRAIN EAST OF PHOENIX EARLY THIS EVENING WHERE LOW-LEVEL CONVERGENCE IS MAXIMIZED ALONG THE FRONT. LAPSE RATES WILL STEEPEN THIS AFTERNOON AS THE MID-LEVEL COLD POOL MAKES SOME SOUTHEASTWARD PROGRESS INTO AZ. HOWEVER...LOW-LEVELS WILL REMAIN RELATIVELY DRY RESULTING IN NEGLIGIBLE SURFACE-BASED AND MLCAPE. SREF CONVECTIVE PROBABILITIES SUGGEST ONLY A SLIGHT CHANCE OF THUNDERSTORMS THIS AFTERNOON AND EVENING...MAINLY NORTH AND EAST OF PHOENIX.

REINFORCING VORT MAXES WILL SLOW THE EASTWARD PROGRESSION OF THE LOW TUESDAY...PROVIDING ANOTHER OPPORTUNITY FOR CLOUDS AND ISOLATED SHOWERS ACROSS THE HIGHER TERRAIN EAST OF PHOENIX. VORTICITY-FORCED ASCENT WILL BE ABUNDANT AND POPS WERE INCREASED MAINLY NORTH AND EAST OF GLOBE. COOLER TEMPERATURES WILL BE SIGNIFICANT AS

WELL...WITH PHOENIX MAX TEMPERATURES ONLY REACHING THE LOWER 70S...THE FIRST TIME IN NEARLY A MONTH. THE COOLER READINGS WILL LINGER INTO WEDNESDAY AND FORECAST HIGHS WERE LOWERED A FEW DEGREES.

OPERATIONAL GFS AND ECMWF IN GENERALLY GOOD AGREEMENT WEDNESDAY IN THE WAKE OF THE DEPARTING LOW THROUGH EARLY NEXT WEEK. EASTERN PACIFIC RIDGE WILL BUILD INTO THE WESTERN CONUS...RESULTING IN STEADY HEIGHT RISES AND A RETURN TO ABOVE NORMAL TEMPERATURES BY THURSDAY. A WEAK AND MOISTURE-STARVED TROUGH WILL LIKELY MOVE THROUGH THE REGION FRIDAY...BUT WITH LITTLE IMPACT IN TERMS OF SENSIBLE WEATHER. LOWER DESERT HIGH TEMPERATURES IN THE LOWER 90S EXPECTED FOR THE WEEKEND.

WIND ADVISORY
URGENT - WEATHER MESSAGE
NATIONAL WEATHER SERVICE PHOENIX AZ
445 AM MST MON APR 8 2013

...A STRONG SPRING WEATHER SYSTEM WILL BRING GUSTY WINDS ACROSS SOUTHEAST CALIFORNIA AND SOUTH CENTRAL ARIZONA MONDAY...

AZZ020-021-025-026-CAZ030>033-082300-
/O.CON.KPSR.WI.Y.0008.130408T1700Z-130409T0300Z/
LOWER COLORADO RIVER VALLEY AZ-WEST CENTRAL DESERTS-
YUMA/MARTINEZ LAKE AND VICINITY-SOUTHWEST DESERTS-
JOSHUA TREE NATIONAL PARK-LOWER COLORADO RIVER VALLEY CA-
RIVERSIDE COUNTY/EASTERN DESERTS-IMPERIAL COUNTY-
INCLUDING THE CITIES OF...EHRENBERG...PARKER...QUARTZSITE...
SALOME...FORTUNA FOOTHILLS...YUMA...TACNA...WELLTON...
COTTONWOOD VISITOR CENTER...BLYTHE...CHIRIACO SUMMIT...
DESERT CENTER...BRAWLEY...CALEXICO...EL CENTRO
445 AM MST MON APR 8 2013 /445 AM PDT MON APR 8 2013/

...WIND ADVISORY REMAINS IN EFFECT FROM 10 AM MST /10 AM PDT/ THIS MORNING TO 8 PM MST /8 PM PDT/ THIS EVENING...

A WIND ADVISORY REMAINS IN EFFECT FROM 10 AM MST /10 AM PDT/ THIS MORNING TO 8 PM MST /8 PM PDT/ THIS EVENING.

* AFFECTED AREA...JOSHUA TREE NATIONAL PARK...THE SOUTHEAST CALIFORNIA DESERTS AND THE LOWER COLORADO RIVER VALLEY... INCLUDING YUMA...EL CENTRO AND BLYTHE.

* TIMING...BREEZY AND LOCALLY VERY GUSTY WINDS WILL INCREASE IN SPEED MONDAY MORNING...PEAKING BY EARLY AFTERNOON. THESE STRONG WINDS WILL CONTINUE INTO THE EARLY EVENING.

* WINDS...WEST WINDS SUSTAINED 20 TO 35 MPH WITH GUSTS TO 45 MPH.

* IMPACTS...GUSTY WINDS WILL CAUSE AREAS OF BLOWING DUST AND SAND WITH THE POTENTIAL TO RAPIDLY REDUCE VISIBILITY AND CREATE DANGEROUS DRIVING CONDITIONS. HIGH PROFILE VEHICLES TRAVELING ON NORTH AND SOUTH ROADS MAY EXPERIENCE DIFFICULT DRIVING CONDITIONS DUE TO STRONG CROSSWINDS. UNSECURED SMALL OBJECTS...SUCH AS LAWN FURNITURE...MAY BECOME AIRBORNE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A WIND ADVISORY MEANS THAT SUSTAINED WIND SPEEDS OF BETWEEN
30 AND 40 MPH ARE EXPECTED...OR WIND GUSTS OF BETWEEN 40 AND
58 MPH. WINDS THIS STRONG CAN MAKE DRIVING DIFFICULT...ESPECIALLY
FOR HIGH PROFILE VEHICLES. IN ADDITION...STRONG WINDS OVER DESERT
AREAS COULD RESULT IN BRIEFLY LOWERED VISIBILITIES TO WELL UNDER
A MILE AT TIMES IN BLOWING DUST OR BLOWING SAND. USE EXTRA
CAUTION.

NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-
SOUTHERN GILA COUNTY/TONTO NATIONAL FOREST FOOTHILLS-
SOUTHWEST MARICOPA COUNTY-
NORTHWEST AND NORTH CENTRAL PINAL COUNTY-
INCLUDING THE CITIES OF...BUCKEYE...NEW RIVER...WICKENBURG...
MESA...PHOENIX...GLOBE...MIAMI...SAN CARLOS...SUPERIOR...
TOP-OF-THE-WORLD...GILA BEND...APACHE JUNCTION...CASA GRANDE...
FLORENCE
445 AM MST MON APR 8 2013

...WIND ADVISORY REMAINS IN EFFECT FROM 10 AM THIS MORNING TO
8 PM MST THIS EVENING...

A WIND ADVISORY REMAINS IN EFFECT FROM 10 AM THIS MORNING TO 8 PM
MST THIS EVENING.

* AFFECTED AREA...THE SOUTHWEST AND SOUTH CENTRAL ARIZONA
  DESERTS...INCLUDING THE PHOENIX METRO AREA AND SOUTHERN GILA
  COUNTY INCLUDING GLOBE.

* TIMING...WINDS WILL NOTICEABLY INCREASE THROUGH THE MORNING...
  PEAKING BY MID AFTERNOON AND REMAINING ELEVATED THROUGH THE
  EARLY EVENING.

* WINDS...WEST TO SOUTHWEST WINDS 20 TO 35 MPH WITH GUSTS OF 45
  TO 50 MPH.

* IMPACTS...GUSTY WINDS WILL CAUSE AREAS OF BLOWING DUST AND SAND
  WITH THE POTENTIAL TO RAPIDLY REDUCE VISIBILITY AND CREATE
  DANGEROUS DRIVING CONDITIONS. HIGH PROFILE VEHICLES TRAVELING ON
  NORTH AND SOUTH ROADS MAY EXPERIENCE DIFFICULT DRIVING CONDITIONS
  DUE TO STRONG CROSSWINDS. UNSECURED SMALL OBJECTS...SUCH AS LAWN
  FURNITURE...MAY BECOME AIRBORNE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A WIND ADVISORY MEANS THAT SUSTAINED WIND SPEEDS OF BETWEEN
30 AND 40 MPH ARE EXPECTED...OR WIND GUSTS OF BETWEEN 40 AND
58 MPH. WINDS THIS STRONG CAN MAKE DRIVING DIFFICULT...ESPECIALLY
FOR HIGH PROFILE VEHICLES. IN ADDITION...STRONG WINDS OVER DESERT
AREAS COULD RESULT IN BRIEFLY LOWERED VISIBILITIES TO WELL UNDER
A MILE AT TIMES IN BLOWING DUST OR BLOWING SAND. USE EXTRA
CAUTION.

HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE PHOENIX AZ
602 AM MST MON APR 8 2013

AZZ020>023-025>028-CAZ030>033-091315-
LOWER COLORADO RIVER VALLEY AZ-WEST CENTRAL DESERTS-
NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-
YUMA/MARTINEZ LAKE AND VICINITY-SOUTHWEST DESERTS-
SOUTHWEST MARICOPA COUNTY-NORTHWEST AND NORTH CENTRAL PINAL COUNTY-
JOSHUA TREE NATIONAL PARK-LOWER COLORADO RIVER VALLEY CA-
RIVERSIDE COUNTY/EASTERN DESERTS-IMPERIAL COUNTY-
602 AM MST MON APR 8 2013 /602 AM PDT MON APR 8 2013/

...WIND ADVISORY IN EFFECT FROM 10 AM MST /10 AM PDT/ THIS MORNING TO 8 PM MST /8 PM PDT/ THIS EVENING...
...RED FLAG WARNING IN EFFECT FROM 11 AM MST /11 AM PDT/ THIS MORNING TO 8 PM MST /8 PM PDT/ THIS EVENING...

THIS HAZARDOUS WEATHER OUTLOOK IS FOR EXTREME SOUTHWEST ARIZONA...EXTREME WEST-CENTRAL ARIZONA...SOUTH-CENTRAL ARIZONA...SOUTHWEST ARIZONA...WEST-CENTRAL ARIZONA...EXTREME SOUTHEAST CALIFORNIA AND SOUTHEAST CALIFORNIA.

.DAY ONE...TODAY AND TONIGHT.

STRONG WINDS WILL DEVELOP THIS MORNING ACROSS SOUTHEAST CALIFORNIA...SPREADING EAST INTO ARIZONA DURING THE AFTERNOON AS A LOW PRESSURE SYSTEM MOVES TOWARDS THE DESERT SOUTHWEST. WIND GUSTS WILL EXCEED 40 MPH WHICH WILL PRODUCE AREAS OF BLOWING DUST WITH REDUCED VISIBILITIES. SOME MORE EXPOSED WIND PRONE LOCATIONS MAY SEE WINDS GUSTS AS HIGH AS 55 MPH THIS AFTERNOON. THE WINDY AND DRY CONDITIONS WILL ALSO CREATE HAZARDOUS FIRE WEATHER CONDITIONS AND PROMOTE THE SPREAD OF WILDFIRES. CONDITIONS ARE EXPECTED TO IMPROVE LATE THIS EVENING.

PRELIMINARY LOCAL STORM REPORT
NATIONAL WEATHER SERVICE PHOENIX AZ
844 AM MST MON APR 08 2013

..TIME... ..DATE...	...EVENT... ....MAG.... ..REMARKS..	...CITY LOCATION... ..COUNTY LOCATION..ST..	...LAT.LON... ...SOURCE....
0837 AM 04/08/2013	NON-TSTM WND GST M46 MPH	SEELEY IMPERIAL CA	32.78N 115.68W TRAINED SPOTTER
	VISIBILITY 2 MILES IN BLOWING DUST		

BLOWING DUST ADVISORY
URGENT - WEATHER MESSAGE
NATIONAL WEATHER SERVICE PHOENIX AZ
1000 AM MST MON APR 8 2013

LOWER COLORADO RIVER VALLEY AZ-WEST CENTRAL DESERTS-
YUMA/MARTINEZ LAKE AND VICINITY-SOUTHWEST DESERTS-
JOSHUA TREE NATIONAL PARK-LOWER COLORADO RIVER VALLEY CA-
RIVERSIDE COUNTY/EASTERN DESERTS-IMPERIAL COUNTY-
INCLUDING THE CITIES OF...EHRENBERG...PARKER...QUARTZSITE...
SALOME...FORTUNA FOOTHILLS...YUMA...TACNA...WELLTON...
COTTONWOOD VISITOR CENTER...BLYTHE...CHIRIACO SUMMIT...

DESERT CENTER...BRAWLEY...CALEXICO...EL CENTRO
1000 AM MST MON APR 8 2013 /1000 AM PDT MON APR 8 2013/

...BLOWING DUST ADVISORY IN EFFECT UNTIL 8 PM MST /8 PM PDT/ THIS EVENING...
...WIND ADVISORY REMAINS IN EFFECT UNTIL 8 PM MST /8 PM PDT/ THIS EVENING...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A BLOWING DUST ADVISORY...WHICH IS IN EFFECT UNTIL 8 PM MST /8 PM PDT/ THIS EVENING. A WIND ADVISORY REMAINS IN EFFECT UNTIL 8 PM MST /8 PM PDT/ THIS EVENING.

* AFFECTED AREA...JOSHUA TREE NATIONAL PARK...THE SOUTHEAST CALIFORNIA DESERTS AND THE LOWER COLORADO RIVER VALLEY... INCLUDING YUMA...EL CENTRO AND BLYTHE.

* TIMING...BREEZY AND LOCALLY VERY GUSTY WINDS WILL INCREASE THROUGH THE REST OF THE DAY. THESE STRONG WINDS WILL CONTINUE INTO THE EARLY EVENING HOURS.

* WINDS...WEST WINDS SUSTAINED 20 TO 35 MPH WITH GUSTS TO 45 MPH.

* VISIBILITY...LESS THAN 1 MILE AT TIMES.

* IMPACTS...GUSTY WINDS WILL CAUSE AREAS OF BLOWING DUST AND SAND WITH THE POTENTIAL TO RAPIDLY REDUCE VISIBILITY AND CREATE DANGEROUS DRIVING CONDITIONS. HIGH PROFILE VEHICLES TRAVELING ON NORTH AND SOUTH ROADS MAY EXPERIENCE DIFFICULT DRIVING CONDITIONS DUE TO STRONG CROSSWINDS. UNSECURED SMALL OBJECTS... SUCH AS LAWN FURNITURE...MAY BECOME AIRBORNE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A WIND ADVISORY MEANS THAT SUSTAINED WIND SPEEDS OF BETWEEN 30 AND 40 MPH ARE EXPECTED...OR WIND GUSTS OF BETWEEN 40 AND 58 MPH. WINDS THIS STRONG CAN MAKE DRIVING DIFFICULT...ESPECIALLY FOR HIGH PROFILE VEHICLES. IN ADDITION...STRONG WINDS OVER DESERT AREAS COULD RESULT IN BRIEFLY LOWERED VISIBILITIES TO WELL UNDER A MILE AT TIMES IN BLOWING DUST OR BLOWING SAND. USE EXTRA CAUTION.

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-
SOUTHWEST MARICOPA COUNTY-
NORTHWEST AND NORTH CENTRAL PINAL COUNTY-
INCLUDING THE CITIES OF...BUCKEYE...NEW RIVER...WICKENBURG...
MESA...PHOENIX...GILA BEND...APACHE JUNCTION...CASA GRANDE...
FLORENCE
1000 AM MST MON APR 8 2013

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...BLOWING DUST ADVISORY IN EFFECT UNTIL 8 PM MST THIS EVENING...
...WIND ADVISORY REMAINS IN EFFECT UNTIL 8 PM MST THIS EVENING...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A BLOWING DUST
ADVISORY...WHICH IS IN EFFECT UNTIL 8 PM MST THIS EVENING. A WIND
ADVISORY REMAINS IN EFFECT UNTIL 8 PM MST THIS EVENING.

* AFFECTED AREA...THE SOUTHWEST AND SOUTH CENTRAL ARIZONA
  DESERTS...INCLUDING THE PHOENIX METRO AREA.

* TIMING...WINDS WILL CONTINUE INCREASING THROUGH THE REST OF THE
  DAY...PEAKING BY MID AFTERNOON AND REMAINING ELEVATED THROUGH THE
  EARLY EVENING HOURS.

* WINDS...WEST TO SOUTHWEST WINDS 20 TO 35 MPH WITH GUSTS OF 45
  TO 50 MPH.

* VISIBILITY...LESS THAN 1 MILE AT TIMES.

* IMPACTS...GUSTY WINDS WILL CAUSE AREAS OF BLOWING DUST AND
  SAND WITH THE POTENTIAL TO RAPIDLY REDUCE VISIBILITY AND
  CREATE DANGEROUS DRIVING CONDITIONS. HIGH PROFILE VEHICLES
  TRAVELING ON NORTH AND SOUTH ROADS MAY EXPERIENCE DIFFICULT
  DRIVING CONDITIONS DUE TO STRONG CROSSWINDS. UNSECURED SMALL
  OBJECTS... SUCH AS LAWN FURNITURE...MAY BECOME AIRBORNE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A WIND ADVISORY MEANS THAT SUSTAINED WIND SPEEDS OF BETWEEN
30 AND 40 MPH ARE EXPECTED...OR WIND GUSTS OF BETWEEN 40 AND
58 MPH. WINDS THIS STRONG CAN MAKE DRIVING DIFFICULT...ESPECIALLY
FOR HIGH PROFILE VEHICLES. IN ADDITION...STRONG WINDS OVER DESERT
AREAS COULD RESULT IN BRIEFLY LOWERED VISIBILITIES TO WELL UNDER
A MILE AT TIMES IN BLOWING DUST OR BLOWING SAND. USE EXTRA
CAUTION.

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER
BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT
APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR
VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR
FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.
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PRELIMINARY LOCAL STORM REPORT

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NATIONAL WEATHER SERVICE PHOENIX AZ
134 PM MST MON APR 08 2013

..TIME...    ...EVENT...       ...CITY LOCATION...      ...LAT.LON...
..DATE...    ....MAG....       ..COUNTY LOCATION..ST..  ...SOURCE....
             ..REMARKS..

0127 PM      NON-TSTM WND GST  4 NW EL CENTRO           32.83N 115.61W
04/08/2013   M58 MPH           IMPERIAL            CA   ASOS

             MEASURED AT NAVAL AIR STATION KNJK SUSTAINED 46 MPH
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            WITH GUSTS TO 58 MPH
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PRELIMINARY LOCAL STORM REPORT

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NATIONAL WEATHER SERVICE PHOENIX AZ
233 PM MST MON APR 08 2013

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
            ..REMARKS..

0130 PM     NON-TSTM WND DMG 4 SSE TUMBLEWEED PARK   33.22N 111.79W
04/08/2013                   MARICOPA           AZ   TRAINED SPOTTER

            LARGE TREE FELL AND KNOCKED DOWN BRICK WALL. NEAR RIGGS
            AND GILBERT RD. TIME ESTIMATED.
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PRELIMINARY LOCAL STORM REPORT

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NATIONAL WEATHER SERVICE PHOENIX AZ
548 PM MST MON APR 08 2013

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
            ..REMARKS..

0500 PM     NON-TSTM WND DMG YUMA                    32.68N 114.62W
04/08/2013                   YUMA               AZ   TRAINED SPOTTER

            LARGE FICUS TREE FELL ONTO HOME. 19TH ST AND MCKINLEY.
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AREA FORECAST DISCUSSION

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NATIONAL WEATHER SERVICE PHOENIX AZ
840 PM MST MON APR 8 2013

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.SYNOPSIS...A STRONG AREA OF LOW PRESSURE WILL SLOWLY MOVE THROUGH THE AREA
THROUGH TUESDAY...RESULTING IN CONTINUED WINDY CONDITIONS THROUGH
THIS EVENING ALONG WITH MUCH COOLER TEMPERATURES TOMORROW. HIGH
PRESSURE WILL GRADUALLY RETURN TO THE AREA ON WEDNESDAY WITH WARMING
TEMPERATURES AND DRY CONDITIONS EXPECTED THROUGH THE REMAINDER OF
THE WEEK.

&&

.DISCUSSION...THE STRONG UPPER LOW THAT BROUGHT THE REGION WIDESPREAD STRONG
WINDS...BLOWING DUST...AND SCATTERED SHOWERS AND THUNDERSTORMS IS
NOW MOVING ACROSS SOUTHERN UTAH THIS EVENING...AND IS EXPECTED TO
REACH THE FOUR-CORNERS REGION BY EARLY TUESDAY. A BAND OF SHOWERS
AND A FEW THUNDERSTORMS ALONG THE SURFACE FRONT BROUGHT 0.05 INCH OF
RAIN TO SKY HARBOR WITH A FEW SPOTS ACROSS THE NORTHERN PORTION OF
THE PHOENIX AREA REPORTING AS MUCH AS 0.12 OF AN INCH OF RAIN. AS
THE FRONT AND ASSOCIATED TROF CONTINUE TO MOVE OFF TO THE EAST...THE
SHOWERS ARE EXPECTED TO INTO THE HIGHER TERRAIN NORTH AND EAST OF
PHOENIX BY LATE THIS EVENING...WITH THE WINDS CONTINUING TO SLOWLY
DIMINISH OVER THE REGION AS WELL. THESE WINDS HAVE ALREADY
DIMINISHED ENOUGH TO ALLOW THE WIND AND DUST ADVISORIES AND WARNING
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THAT WE HAD EARLIER ISSUED TO EXPIRE AT 8PM. THE RED FLAG WARNING
WAS ALSO ALLOWED TO EXPIRE AS WELL. OTHER THEN SOME CHANGES IN THE
SHORT-TERM GRIDS TO REFLECT THE EXPIRATION OF THESE PRODUCTS...AND
FOR INCREASED RAINFALL COVERAGE ACROSS SOUTH-CENTRAL ARIZONA THIS
EVENING...CURRENT GRIDDED AND TEXT FORECASTS LOOK GOOD...NO FURTHER
UPDATES ARE PLANNED AT THIS TIME.

&&

.PREVIOUS DISCUSSION...WIND EVENT IS UNDERWAY ACROSS THE REGION THIS
AFTERNOON AS A LARGE AREA OF LOW PRESSURE MOVES THROUGH THE AREA. PEAK WIND
GUSTS AS OF 20Z HAVE GENERALLY BEEN IN THE 35-40 MPH RANGE ACROSS THE PHOENIX
METRO...WITH 60+ MPH GUSTS REPORTED ACROSS PORTIONS OF WESTERN IMPERIAL
COUNTY IN SOUTHEAST CALIFORNIA. WENT AHEAD AND ISSUED A
HIGH WIND WARNING FOR IMPERIAL COUNTY GIVEN A HANDFUL OF OBS ABOVE
60 MPH. WILL LET IT EXPIRE ALONG WITH EVERYTHING ELSE AT 03Z.

SAW QUITE A BIT OF BLOWING DUST EARLIER THIS MORNING...FOLLOWED BY A
SLIGHT RECOVERY IN VISIBILITIES AROUND NOON. WINDS ARE ONCE AGAIN
INCREASING ACROSS THE AREA COINCIDENT WITH DEEPEST BL MIXING AND
TIGHTENING PRESSURE GRADIENT. I EXPECT BLOWING DUST TO ONCE AGAIN
PICK UP BY 21Z AND LINGER THROUGH THE REST OF THE EVENING RUSH
HOUR...EVENTUALLY TAPERING OFF SHORTLY AFTER SUNSET AS THE BL
STABILIZES. WHILE WE HAVEN\T SEEN WIDESPREAD VSBYS BELOW A QUARTER
OF A MILE...EXPECT THE NORMALLY VULNERABLE AREAS /OF PARTICULAR
NOTE: AREAS ALONG I-10 AND SR 347/ TO SEE SHARPLY REDUCED VSBYS AT
TIMES THROUGH LATE AFTERNOON. BLOWING DUST WILL ALSO CONTINUE ACROSS
SOUTHWEST ARIZONA AND SOUTHEAST CALIFORNIA THROUGH LATE AFTERNOON.
THE BLOWING DUST ADVISORY WILL EXPIRE AT 03Z.

MEANWHILE...A FEW SHOWERS HAVE DEVELOPED ALONG A SURFACE COLD FRONT
STRETCHING ROUGHLY FROM FLAGSTAFF TO GILA BEND. DESPITE PW VALUES
ONLY AROUND A HALF INCH...THIS IS ACTUALLY SLIGHTLY ABOVE NORMAL FOR
THIS TIME OF YEAR /APPROX 120 PERCENT OF NORMAL PER BLENDED TPW
IMAGERY/ AND I WOULD NOT BE SURPRISED TO SEE A FEW SPRINKLES OR VERY
LIGHT RAIN SHOWERS ACROSS THE METRO THROUGH LATE AFTERNOON. SHOWERS
HAVE BEEN MORE WIDESPREAD TO THE NORTH AND I WILL HANG ONTO
RELATIVELY HIGH POPS NORTH/EAST OF PHOENIX THROUGH THIS EVENING.
SREF POPS ARE IN THE UPPER SINGLE DIGITS TONIGHT ACROSS THE DESERTS
WITH VALUES APPROACHING 90 PERCENT AROUND GLOBE. DREW IN A SIMILAR
GRADIENT FOR THIS EVENING WITH SHOWERS DECREASING AFTER 06Z AT ALL
LOCATIONS.

THE LOW WILL SLOWLY EXIT THE AREA TOMORROW...BUT NOT BEFORE A
SECONDARY SHORTWAVE TROUGH SWEEPS THROUGH NORTHERN/EASTERN ARIZONA.
ONCE AGAIN...THE BEST OPPORTUNITY FOR PRECIP WILL BE FROM PHOENIX
EASTWARD AND SIMILAR POPS /LOW TEENS IN PHOENIX...30S AND 40S IN
GLOBE/ SEEM APPROPRIATE GIVEN THE SITUATION. BY TOMORROW AFTERNOON
PW VALUES WILL HAVE RETREATED TO AROUND 0.3 INCHES AND IT WILL BE
QUITE DIFFICULT TO GET MUCH /IF ANY/ MEASURABLE PRECIP ACROSS THE
AREA. ISENTROPIC FORCING WITH THIS SECONDARY TROUGH WILL BE
CONSIDERABLY LESS THAN WHAT WAS SEEN TODAY...THUS PRECIP CHANCES
SHOULD BE CONSIDERABLY LOWER.

TEMPS WILL TAKE A TUMBLE TOMORROW WITH HIGHS ONLY REACHING THE
LOW/MID 70S. AS 850MB TEMPS WILL DROP APPROX 5-8C FROM TODAY TO
TOMORROW...MID 70S SEEMS LIKE AN APPROPRIATE FORECAST FOR TOMORROW.

&&

.PREVIOUS DISCUSSION...OPERATIONAL GFS AND ECMWF IN GENERALLY GOOD AGREEMENT WEDNESDAY IN THE WAKE OF THE DEPARTING LOW THROUGH EARLY NEXT WEEK. EASTERN PACIFIC RIDGE WILL BUILD INTO THE WESTERN CONUS...RESULTING IN STEADY HEIGHT RISES AND A RETURN TO ABOVE NORMAL TEMPERATURES BY THURSDAY. A WEAK AND MOISTURE-STARVED TROUGH WILL LIKELY MOVE THROUGH THE REGION FRIDAY...BUT WITH LITTLE IMPACT IN TERMS OF SENSIBLE WEATHER. LOWER DESERT HIGH TEMPERATURES IN THE LOWER 90S EXPECTED FOR THE WEEKEND.

&&

.AVIATION...SOUTH-CENTRAL AZ...INCLUDING KPHX...KIWA...AND KSDL... ISOLATED SHOWERS AND THUNDERSTORMS TO AFFECT THE TERMINALS OVER THE NEXT HOUR OR SO AS THE MAIN FRONT MOVES THROUGH THE PHOENIX AREA. WINDS WILL CONTINUE TO DIMINISH THROUGH THE REST OF THE EVENING HOURS AS THE WINDS ALOFT SLOWLY DIMINISH.

SOUTHWEST AZ AND SOUTHEAST CA...INCLUDING KIPL AND KBLH...VERY STRONG SURFACE WINDS...GUSTING 40-50 KNOTS...WILL CONTINUE OVER IMPERIAL COUNTY INTO THE EARLY EVENING BEFORE WEAKENING. ANTICIPATE WIDESPREAD VISIBILITIES AT OR BELOW 1SM IN BLOWING SAND AND DUST BEFORE IMPROVING AS WINDS WEAKEN. EXPECT LESS WIND OVER THE LOWER COLORADO RIVER VALLEY....BY ABOUT 10-15 KNOTS...COMPARED TO THE IMPERIAL VALLEY. IF SURFACE WINDS DECREASE BELOW 10-15 KNOTS TONIGHT...LOW LEVEL WIND SHEAR MAY BE PRESENT. ANTICIPATE BREEZY TO WINDY CONDITIONS TO REDEVELOP BY MIDDAY TUESDAY WITH GUSTS OF 20-30 KTS. OTHERWISE...WINDS WILL BE SUBSTANTIALLY LIGHTER.

AVIATION DISCUSSION NOT UPDATED FOR AMENDED TAFS.

ZONE FORECASTS FOR SOUTHWEST ARIZONA/SOUTHEAST CALIFORNIA
NATIONAL WEATHER SERVICE PHOENIX AZ
326 AM MST TUE APR 9 2013

GREATER PHOENIX AREA-
INCLUDING...BUCKEYE...CAREFREE...CAVE CREEK...CHANDLER...
FOUNTAIN HILLS...GILBERT...GLENDALE...MESA...PEORIA...PHOENIX...
SCOTTSDALE...SUN CITY...AND TEMPE
326 AM MST TUE APR 9 2013

.TODAY...PARTLY CLOUDY. ISOLATED SHOWERS IN THE MORNING...THEN A SLIGHT CHANCE OF AFTERNOON SHOWERS AND AN ISOLATED THUNDERSTORM. BREEZY AND MUCH COOLER. HIGHS 68 TO 73. WEST WIND 15 TO 25 MPH. CHANCE OF MEASURABLE RAIN 10 PERCENT.
.TONIGHT...PARTLY CLOUDY IN THE EVENING...THEN BECOMING CLEAR. LOWS 44 TO 54. WEST WIND 10 TO 20 MPH IN THE EVENING BECOMING NORTH 5 TO 10 MPH AFTER MIDNIGHT.
.WEDNESDAY...SUNNY AND WARMER. HIGHS 73 TO 78. NORTHEAST WIND 5 TO 10 MPH IN THE MORNING BECOMING NORTHWEST IN THE AFTERNOON.
.WEDNESDAY NIGHT...CLEAR. LOWS 45 TO 55. NORTH WIND 5 TO 10 MPH IN THE EVENING BECOMING NORTHEAST AROUND 5 MPH AFTER MIDNIGHT.
.THURSDAY...MOSTLY SUNNY AND WARMER. HIGHS 80 TO 85. SOUTH WIND AROUND 5 MPH IN THE MORNING BECOMING SOUTHWEST 5 TO 10 MPH IN THE AFTERNOON.

.THURSDAY NIGHT...MOSTLY CLEAR. NOT AS COOL. LOWS IN THE LOWER 50S TO LOWER 60S.
.FRIDAY AND FRIDAY NIGHT...CLEAR. LOWS IN THE LOWER 50S TO LOWER 60S. HIGHS IN THE MID TO UPPER 80S.
.SATURDAY THROUGH SUNDAY...CLEAR. LOWS IN THE LOWER 50S TO LOWER 60S. HIGHS 85 TO 90.
.SUNDAY NIGHT AND MONDAY...MOSTLY CLEAR. LOWS IN THE MID 50S TO MID 60S. HIGHS IN THE MID TO UPPER 80S.

YUMA/MARTINEZ LAKE AND VICINITY-
INCLUDING...FORTUNA FOOTHILLS...SAN LUIS...SOMERTON...AND YUMA
326 AM MST TUE APR 9 2013

.TODAY...SUNNY AND BREEZY. HIGHS NEAR 77. NORTHWEST WIND 10 TO 20 MPH. GUSTS UP TO 30 MPH.
.TONIGHT...CLEAR. LOWS 53 TO 57. NORTHWEST WIND 5 TO 15 MPH.
.WEDNESDAY...SUNNY...BREEZY AND WARMER. HIGHS NEAR 82. NORTH WIND 15 TO 25 MPH.
.WEDNESDAY NIGHT...CLEAR. LOWS 54 TO 57. NORTHWEST WIND 10 TO 15 MPH IN THE EVENING BECOMING LIGHT AFTER MIDNIGHT.
.THURSDAY...SUNNY AND WARMER. HIGHS NEAR 89. SOUTHWEST WIND 5 TO 10 MPH.
.THURSDAY NIGHT THROUGH SUNDAY...CLEAR. LOWS IN THE UPPER 50S TO LOWER 60S. HIGHS AROUND 90.
.SUNDAY NIGHT AND MONDAY...MOSTLY CLEAR. LOWS IN THE UPPER 50S TO LOWER 60S. HIGHS IN THE UPPER 80S.

PUBLIC INFORMATION STATEMENT
NATIONAL WEATHER SERVICE PHOENIX AZ
230 PM MST MON APR 8 2013

...HIGHEST WIND GUSTS SO FAR THIS AFTERNOON...

...A WIND ADVISORY REMAINS IN EFFECT UNTIL 8 PM MST /8 PM PDT/ FOR ALL OF SOUTHEAST CALIFORNIA...WESTERN AND CENTRAL ARIZONA...

...SOUTHEAST CALIFORNIA...	WIND GUST	TIME
IN KO PAH (3221 FT) (SDGE)	56 MPH	1010 AM
FISH CREEK MOUNTAINS (781 FT) (RAWS)	70 MPH	1026 AM
EL CENTRO NAVEL (-43 FT) (NWS)	60 MPH	152 PM
IMPERIAL AIRPORT (-56 FT) (NWS)	51 MPH	922 AM
SEELEY (SPOTTER)	46 MPH	837 AM
CAHUILLA (278 FT) (RAWS)	44 MPH	210 PM
BUTTERCUP (217 FT) (RAWS)	36 MPH	1209 PM
SALTON CITY (-154 FT) (CWOP)	33 MPH	842 AM
LOST HORSE (4133 FT) (RAWS)	35 MPH	700 AM
RICE VALLEY (831 FT) (RAWS)	40 MPH	950 AM
BLYTHE AIRPORT (397 FT) (NWS)	38 MPH	852 AM
SQUAW LAKE (285 FT) (RAWS)	30 MPH	1127 AM
...WESTERN ARIZONA...		
FORT YUMA (185 FT) (RAWS)	34 MPH	216 PM
PARKER AHAKHAV (363 FT) (RAWS)	33 MPH	1126 AM
SALOME (1342 FT) (CWOP)	38 MPH	904 AM
CIBOLA (230 FT) (RAWS)	21 MPH	1048 AM

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WENDEN (1980 FT) (CWOP)                  36 MPH      954 AM
SMITH PEAK (2500 FT) (RAWS)              49 MPH     1053 AM
BELMONT (1855 FT) (RAWS)                 39 MPH      101 PM


...CENTRAL ARIZONA...

GILA BEND AUXILIARY FIELD (859 FT (NWS)  39 MPH     1255 AM
GOODYEAR (1027 FT) (CWOP)                49 MPH      139 PM
BUCKEYE AIRPORT (1020 FT) (NWS)          39 MPH     1235 PM
LUKE AFB (1089 FT) (NWS)                 45 MPH     1214 PM
GLENDALE AIRPORT (1066 FT) (NWS)         41 MPH     1150 AM
DEER VALLEY AIRPORT (1486 FT) (NWS       41 MPH     1242 PM
LAKE PLEASANT (1750 FT) (ALERT)          42 MPH     1029 AM
CAREFREE (2530 FT) (CWOP)                37 MPH      127 PM
CAVE CREEK (2185 FT) (CWOP)              38 MPH      127 PM
BARTLETT LAKE (1670 FT) (ALERT)          46 MPH      114 PM
NORTH SCOTTSDALE (2710 FT) (CWOP)        44 MPH      122 PM
SOUTH MOUNTAIN FAN (1250 FT) (ALERT)     36 MPH     1244 PM
MESA (1250 FT) (CWOP)                    41 MPH     1152 AM
MESA GATEWAY AIRPORT (1381 FT) (NWS)     40 MPH      947 AM
SKY HARBOR AIRPORT (1115 FT) (NWS)       39 MPH     1048 AM
CHANDLER AIRPORT (1243 FT) (NWS)         46 MPH     1147 AM
EMF AT ARIZONA AVE (1215 FT) (ALERT)     31 MPH     1229 PM
MARICOPA (1250 FT) (CWOP)                39 MPH      117 PM
GILA RIVER (1272 FT) (RAWS)              37 MPH     1022 AM
CASA GRANDE AIRPORT (1463 FT) (NWS)      43 MPH     1215 PM
FLORENCE (1814 FT) (CWOP)                39 MPH      119 PM
MAGMA (1750 FT) (ALERT)                  33 MPH     1259 PM

...EAST MARICOPA/SOUTHERN GILA COUNTY...

TONTO BASIN (2414 FT) (RAWS)             45 MPH      211 PM
GLOBE (4137 FT) (RAWS)                   47 MPH      106 PM
GLOBE (SPOTTER)                          60 MPH     1214 PM
SAN CARLOS (2830 FT) (RAWS)              41 MPH      114 PM
HILLTOP (5732 FT) (RAWS)                 29 MPH      105 PM

WIND GUST OBSERVATIONS PROVIDED ABOVE ARE COLLECTED THROUGH VARIOUS
AGENCIES IN COOPERATION WITH THE NATIONAL WEATHER SERVICE. ALTHOUGH
EVERY EFFORT IS MADE TO ENSURE THE MOST ACCURATE WIND SPEEDS...THIS
DATA IS CONSIDERED PRELIMINARY.
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National Weather Service Tucson Forecast Products

WIND ADVISORY

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URGENT - WEATHER MESSAGE
NATIONAL WEATHER SERVICE TUCSON AZ
915 PM MST SUN APR 7 2013

WESTERN PIMA COUNTY-TOHONO O'ODHAM NATION-
UPPER SANTA CRUZ RIVER VALLEY/ALTAR VALLEY-TUCSON METRO AREA-
SOUTH CENTRAL PINAL COUNTY-SOUTHEAST PINAL COUNTY-
UPPER GILA RIVER VALLEY-
INCLUDING THE CITIES OF...AJO...ORGAN PIPE CACTUS N.M....SELLS...
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NOGALES...TUCSON...GREEN VALLEY...MARANA...VAIL...
PICACHO PEAK STATE PARK...MAMMOTH...ORACLE...CLIFTON...SAFFORD
915 PM MST SUN APR 7 2013

...WIND ADVISORY REMAINS IN EFFECT FROM 11 AM TO 8 PM MST
MONDAY...

* TIMING...THE STRONGEST WINDS ARE EXPECTED BETWEEN 11 AM AND 8
  PM MONDAY.

* WINDS...SUSTAINED WINDS OVER 30 MPH ARE EXPECTED WITH GUSTS OF
  40 TO 45 MPH.

* FOR A DETAILED VIEW OF THE HAZARD AREA...VISIT
  HTTP://WWW.WRH.NOAA.GOV/WRH/WHV/?WFO=TWC

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A WIND ADVISORY MEANS THAT SUSTAINED WINDS OF 30 MPH OR GREATER
ARE EXPECTED IN THE VALLEYS...OR 35 MPH OR GREATER ABOVE
5000 FEET. HIGHER GUSTS ARE ALSO LIKELY. THIS COULD MAKE DRIVING
DIFFICULT...ESPECIALLY FOR HIGH PROFILE VEHICLES. USE EXTRA
CAUTION. ALSO...EXPECT AREAS OF BLOWING DUST WHICH MAY REDUCE
VISIBILITIES GREATLY.

ZONE FORECAST PRODUCT FOR SOUTHEAST ARIZONA
NATIONAL WEATHER SERVICE TUCSON AZ
233 AM MST MON APR 8 2013

TUCSON METRO AREA-
INCLUDING...TUCSON...GREEN VALLEY...MARANA...VAIL
233 AM MST MON APR 8 2013

...BLOWING DUST ADVISORY IN EFFECT FROM 11 AM THIS MORNING TO
8 PM MST THIS EVENING...
...WIND ADVISORY IN EFFECT FROM 11 AM THIS MORNING TO 8 PM MST
THIS EVENING...

.TODAY...VERY WINDY. MOSTLY SUNNY. AREAS OF BLOWING DUST THROUGH
THE DAY. HIGHS 77 TO 82. SOUTH WIND 15 TO 20 MPH WITH GUSTS TO
AROUND 35 MPH INCREASING TO SOUTHWEST 30 TO 40 MPH WITH GUSTS TO
AROUND 55 MPH IN THE AFTERNOON.
.TONIGHT...WINDY. PARTLY CLOUDY WITH CHANCE OF SHOWERS AND SLIGHT
CHANCE OF THUNDERSTORMS. AREAS OF BLOWING DUST. COOLER. LOWS
45 TO 50. SOUTHWEST WIND 25 TO 35 MPH WITH GUSTS TO AROUND 55 MPH
BECOMING WEST 10 TO 15 MPH WITH GUSTS TO AROUND 30 MPH AFTER
MIDNIGHT. CHANCE OF PRECIPITATION 30 PERCENT.
.TUESDAY...PARTLY CLOUDY WITH A 10 PERCENT CHANCE OF SHOWERS AND
THUNDERSTORMS. COOLER. HIGHS 64 TO 69. SOUTHWEST WIND 5 TO 15 MPH
BECOMING WEST 15 TO 20 MPH IN THE AFTERNOON.
.TUESDAY NIGHT...PARTLY CLOUDY. LOWS 42 TO 47. SOUTHWEST WIND
5 TO 15 MPH.
.WEDNESDAY...MOSTLY SUNNY. HIGHS 68 TO 73. SOUTH WIND AROUND
10 MPH BECOMING NORTHWEST IN THE AFTERNOON.
.WEDNESDAY NIGHT...MOSTLY CLEAR. LOWS 46 TO 51.
.THURSDAY...MOSTLY SUNNY. HIGHS 77 TO 82.
.THURSDAY NIGHT...MOSTLY CLEAR. LOWS 50 TO 55.

.FRIDAY...PARTLY CLOUDY. HIGHS 81 TO 86.
.FRIDAY NIGHT THROUGH SUNDAY...MOSTLY CLEAR. LOWS 51 TO 56. HIGHS 81 TO 90.

BLOWING DUST ADVISORY
URGENT - WEATHER MESSAGE
NATIONAL WEATHER SERVICE TUCSON AZ
247 AM MST MON APR 8 2013

WESTERN PIMA COUNTY-TOHONO O'ODHAM NATION-
UPPER SANTA CRUZ RIVER VALLEY/ALTAR VALLEY-TUCSON METRO AREA-
SOUTH CENTRAL PINAL COUNTY-SOUTHEAST PINAL COUNTY-
UPPER GILA RIVER VALLEY-
INCLUDING THE CITIES OF...AJO...ORGAN PIPE CACTUS N.M....SELLS...
NOGALES...TUCSON...GREEN VALLEY...MARANA...VAIL...
PICACHO PEAK STATE PARK...MAMMOTH...ORACLE...CLIFTON...SAFFORD
247 AM MST MON APR 8 2013

...BLOWING DUST ADVISORY IN EFFECT FROM 11 AM THIS MORNING TO
8 PM MST THIS EVENING...
...WIND ADVISORY REMAINS IN EFFECT FROM 11 AM THIS MORNING TO
8 PM MST THIS EVENING...

THE NATIONAL WEATHER SERVICE IN TUCSON HAS ISSUED A BLOWING DUST ADVISORY...WHICH IS IN EFFECT FROM 11 AM THIS MORNING TO 8 PM MST THIS EVENING. THE WIND ADVISORY REMAINS IN EFFECT FOR THE SAME PERIOD.

* IMPACTS...STRONG WINDS WILL CREATE DANGEROUS DRIVING CONDITIONS DUE TO CROSSWINDS AND REDUCED VISIBILITIES DUE TO BLOWING DUST.

* WINDS...SUSTAINED WINDS OVER 30 MPH ARE EXPECTED WITH GUSTS OF 40 TO 50 MPH.

* VISIBILITY...VISIBILITY MAY BE REDUCED TO LESS THAN A MILE AT TIMES...WITH BRIEFLY MUCH LOWER VALUES POSSIBLE. AREAS ALONG INTERSTATE 10 IN PINAL AND PIMA COUNTIES ARE A PARTICULAR CONCERN.

* TIMING...WINDS WILL INCREASE THROUGH THE MORNING HOURS WITH THE STRONGEST WINDS EXPECTED BY MID AFTERNOON.

* FOR A DETAILED VIEW OF THE HAZARD AREA...VISIT HTTP://WWW.WRH.NOAA.GOV/WRH/WHV/?WFO=TWC

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A WIND ADVISORY MEANS THAT SUSTAINED WINDS OF 30 MPH OR GREATER ARE EXPECTED IN THE VALLEYS...OR 35 MPH OR GREATER ABOVE 5000 FEET. HIGHER GUSTS ARE ALSO LIKELY. THIS COULD MAKE DRIVING DIFFICULT...ESPECIALLY FOR HIGH PROFILE VEHICLES. USE EXTRA CAUTION. ALSO...EXPECT AREAS OF BLOWING DUST WHICH MAY REDUCE VISIBILITIES GREATLY.

A BLOWING DUST ADVISORY MEANS THAT BLOWING DUST WILL RESTRICT VISIBILITIES BELOW ONE MILE IN SOME AREAS. TRAVELERS ARE URGED TO

USE CAUTION. IF YOU ENCOUNTER LOCALIZED DENSE BLOWING DUST...
ESPECIALLY NEAR PLOWED FIELDS OR CONSTRUCTION SITES...DO NOT
DRIVE INTO IT IF AT ALL POSSIBLE.

SHORT TERM FORECAST
NATIONAL WEATHER SERVICE TUCSON AZ
1110 AM MST MON APR 8 2013

AZZ501>515-082215-
WESTERN PIMA COUNTY-TOHONO O'ODHAM NATION-
UPPER SANTA CRUZ RIVER VALLEY/ALTAR VALLEY-TUCSON METRO AREA-
SOUTH CENTRAL PINAL COUNTY-SOUTHEAST PINAL COUNTY-
UPPER SAN PEDRO RIVER VALLEY-
EASTERN COCHISE COUNTY BELOW 5000 FEET-UPPER GILA RIVER VALLEY-
WHITE MOUNTAINS OF GRAHAM AND GREENLEE COUNTIES-
GALIURO AND PINALENO MOUNTAINS-CHIRICAHUA MOUNTAINS-
DRAGOON AND MULE AND HUACHUCA AND SANTA RITA MOUNTAINS-
CATALINA AND RINCON MOUNTAINS-BABOQUIVARI MOUNTAINS-
INCLUDING...AJO...ORGAN PIPE CACTUS N.M....SELLS...NOGALES...
TUCSON...GREEN VALLEY...MARANA...VAIL...PICACHO PEAK STATE PARK...
MAMMOTH...ORACLE...SIERRA VISTA...BENSON...WILLCOX...DOUGLAS...
CLIFTON...SAFFORD...HANNAGAN MEADOW...MOUNT GRAHAM...
CHIRICAHUA NM...BISBEE...CANELO HILLS...MADERA CANYON...
MOUNT LEMMON...SUMMERHAVEN...KITT PEAK
1110 AM MST MON APR 8 2013

.NOW...STRONG LATE MORNING WINDS...GUSTING UP TO 35 MPH...BECOMING
STRONGER INTO AND DURING THE AFTERNOON. WINDS WILL BE BLOWING OUT
OF THE SOUTH AT 25 TO 35 MPH WITH GUSTS OF 45 TO 50 MPH. BLOWING
DUST WILL BE A PROBLEM WITH SUDDEN VISIBILITY REDUCTIONS TO LESS
THAN ONE MILE AND BRIEF REDUCTIONS TO LESS THAN ONE QUARTER OF A
MILE THROUGHOUT SOUTHERN ARIZONA...BUT ESPECIALLY ALONG
INTERSTATE 10 NORTH OF MARANA AND UP TO CASA GRANDE. EXPECT CROSS
WINDS ALONG INTERSTATE 10 FROM SAN SIMON EAST TO THE NEW MEXICO
BORDER. ALL HIGH PROFILE VEHICLES MUST BE ALERT AND USE CAUTION.

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE TUCSON AZ
257 PM MST MON APR 8 2013

.SYNOPSIS...A STORM SYSTEM PASSING THROUGH THE REGION WILL CONTINUE
TO BRING VERY WINDY CONDITIONS THIS EVENING...FOLLOWED BY A FEW
SHOWERS AND MUCH COOLER TEMPERATURES TONIGHT AND TUESDAY. DAMAGING
WINDS WILL BE POSSIBLE EARLY THIS EVENING...ESPECIALLY AREAS EAST OF
TUCSON AND NEAR MOUNTAIN LOCATIONS.

&&

.DISCUSSION...THE UPPER LOW OVER SOUTHERN NEVADA WILL CONTINUE TO
TRACK FARTHER EAST THIS EVENING THROUGH NORTHERN ARIZONA. SCATTERED
SHOWERS EXTENDED SOUTH ALONG THE FRONTAL BAND INTO WEST-CENTRAL
ARIZONA AS OF EARLY THIS AFTERNOON. STILL EXPECTING THIS FRONT TO
SWING THROUGH SOUTHEAST ARIZONA THIS EVENING AND TONIGHT AS THE
UPPER LOW ADVANCES EASTWARD. THAT SAID...THE BEST CHANCE OF LIGHT
SHOWERS WILL BE FROM 03Z TO 12Z TUESDAY AS THE FRONT PASSES THROUGH
THE AREA. OTHERWISE...VERY STRONG WINDS AND AREAS OF BLOWING DUST
HAVE BEEN THE MAIN CONCERNS TODAY. SOME PEAK WIND GUSTS HAVE ALREADY

BEEN IN THE 50S IN COCHISE COUNTY AND AT A FEW MOUNTAIN RAWS SITES AS OF 1 PM MST. STILL EXPECTING STRONGER WIND SPEEDS YET TODAY...SO WILL KEEP ADVISORIES AND WARNINGS GOING THROUGH 8 PM MST. A FEW WRAP AROUND SHOWERS WILL BE POSSIBLE TUESDAY AS THE UPPER LOW SLOWLY TRACKS INTO CENTRAL COLORADO. OTHERWISE...EXPECTING IMPROVING WEATHER CONDITIONS ON TUESDAY ALONG WITH COOLER TEMPERATURES BEHIND THE COLD FRONT PASSING THROUGH TODAY. TEMPERATURES WILL REBOUND A BIT WEDNESDAY AND MORE SO THURSDAY TO AROUND NORMAL READINGS.

PUBLIC INFORMATION STATEMENT
NATIONAL WEATHER SERVICE TUCSON AZ
915 PM MST MON APR 8 2013

...UPDATED LIST OF THE HIGHEST WINDS RECORDED IN THE PAST 12 HOURS. WINDS BELOW
35 MPH HAVE BEEN FILTERED OUT...

...LOCATION...	...TIME...	...WIND...
...ARIZONA...		
...COCHISE COUNTY...		
9 SE SIERRA VISTA (4606 FT)(APRSWXNET)	1230 PM APR 8	63 MPH
LIBBY AAF/SIERRA VISTA MUNI AP (ASOS)	1215 PM APR 8	61 MPH
PIONEER FIELD 6 WSW HUACHUCA CITY	126 PM APR 8	58 MPH
MULESHOE RANCH RAWS (4175 FT)(GOES)	403 PM APR 8	55 MPH
DOUGLAS (BISBEE) INTL AP (ASOS)	307 PM APR 8	54 MPH
9 SE SIERRA VISTA (4606 FT)(APRSWXNET)	1229 PM APR 8	51 MPH
25 E WILLCOX (3675 FT)(MESOWEST)	125 PM APR 8	46 MPH
12 ENE WILLCOX (4159 FT)(MESOWEST)	1050 AM APR 8	45 MPH
10 SW SIERRA VISTA (7411 FT)(RAWS)	628 PM APR 8	45 MPH
12 ESE SIERRA VISTA (APRSWXNET)	623 PM APR 8	45 MPH
3 N BISBEE (5377 FT)(APRSWXNET)	1224 PM APR 8	45 MPH
3 WSW BENSON (4250 FT)(APRSWXNET)	712 PM APR 8	45 MPH
10 E SAINT DAVID (4727 FT)(APRSWXNET)	232 PM APR 8	44 MPH
RUCKER CANYON RAWS (5697 FT)(GOES)	557 PM APR 8	44 MPH
23 N BENSON (3212 FT)(APRSWXNET)	334 PM APR 8	43 MPH
HEADQUARTERS RAWS (5400 FT)(GOES)	1237 PM APR 8	42 MPH
5 W BISBEE (4449 FT)(APRSWXNET)	628 PM APR 8	40 MPH
11 SSW WILLCOX (4224 FT)(MESOWEST)	145 PM APR 8	40 MPH
6 E SAINT DAVID (4323 FT)(APRSWXNET)	313 PM APR 8	40 MPH
11 E TOMBSTONE (5013 FT)(APRSWXNET)	244 PM APR 8	40 MPH
20 NNW PIRTLEVILLE (1222 FT)(AWS)	326 PM APR 8	39 MPH
4 NW HUACHUCA CITY (4565 FT)(APRSWXNET)	124 PM APR 8	39 MPH
9 ESE SAINT DAVID (4580 FT)(APRSWXNET)	138 PM APR 8	38 MPH
18 NNW PIRTLEVILLE (4198 FT)(AWS)	410 PM APR 8	38 MPH
9 WNW ROAD FORKS (3771 FT)(MESOWEST)	410 PM APR 8	36 MPH
...GRAHAM COUNTY...		
SAFFORD MUNI AP (3158 FT)(ASOS)	427 PM APR 8	43 MPH
NOON CREEK RAWS (5000 FT)(GOES)	237 PM APR 8	38 MPH
COLUMBINE RAWS (9521 FT)(GOES)	202 PM APR 8	38 MPH
...GREENLEE COUNTY...		
GUTHRIE (6340 FT)(RAWS)	403 PM APR 8	61 MPH
STRAY HORSE RAWS (7790 FT)(GOES)	319 PM APR 8	37 MPH
TRAIL CABIN RAWS (6279 FT)(GOES)	535 PM APR 8	36 MPH

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...PIMA COUNTY...
8 ESE CATALINA (7871 FT)(APRSWXNET)          250 PM APR 8      62 MPH
EMPIRE RAWS (4650 FT)(GOES)                  553 PM APR 8      55 MPH
RYAN FIELD (2417 FT)(AWOS)                   345 PM APR 8      54 MPH
TUCSON INTERNATIONAL AIRPORT (ASOS)          440 PM APR 8      49 MPH
7 SSW ORO VALLEY (2675 FT)(COOP)             213 PM APR 8      47 MPH
4 W ORO VALLEY (2749 FT)(APRSWXNET)          257 PM APR 8      47 MPH
9 E TUCSON (3041 FT)(APRSWXNET)              333 PM APR 8      46 MPH
SASABE RAWS (3500 FT)(GOES)                  405 PM APR 8      44 MPH
9 SE TUCSON (2582 FT)(APRSWXNET)             254 PM APR 8      44 MPH
4 W ORO VALLEY (2749 FT)(APRSWXNET)          201 PM APR 8      40 MPH
8 W TUCSON (2591 FT)(APRSWXNET)              310 PM APR 8      40 MPH
7 ENE TUCSON (2572 FT)(APRSWXNET)            324 PM APR 8      40 MPH
SELLS RAWS (2366 FT)(GOES)                   614 PM APR 8      40 MPH
12 ENE TUCSON (2762 FT)(APRSWXNET)           140 PM APR 8      38 MPH
8 E TUCSON (2887 FT)(APRSWXNET)              332 PM APR 8      38 MPH
10 NE TUCSON (2727 FT)(APRSWXNET)            342 PM APR 8      37 MPH
10 N GREEN VALLEY (2765 FT)(APRSWXNET)      1230 PM APR 8      37 MPH
5 NW TUCSON (2405 FT)(AWS)                   244 PM APR 8      37 MPH
2 SW ORO VALLEY (2680 FT)(APRSWXNET)         215 PM APR 8      36 MPH
16 ENE GREEN VALLEY (APRSWXNET)              320 PM APR 8      36 MPH
9 NE TUCSON (2650 FT)(APRSWXNET)             335 PM APR 8      36 MPH
3 E GREEN VALLEY (2954 FT)(AWS)              145 PM APR 8      36 MPH

...PINAL COUNTY...
HORSE CAMP CANYON RAWS (4040 FT)(GOES)       402 PM APR 8      57 MPH
6 SE FLORENCE (1814 FT)(APRSWXNET)           109 PM APR 8      39 MPH
7 NNW CATALINA (3441 FT)(APRSWXNET)          354 PM APR 8      35 MPH

...SANTA CRUZ COUNTY...
12 W SIERRA VISTA (5000 FT)(RAWS)            608 PM APR 8      51 MPH
NOGALES INTERNATIONAL AIRPORT (ASOS)         556 PM APR 8      49 MPH
HOPKINS RAWS (7120 FT)(GOES)                 419 PM APR 8      41 MPH
14 NE PATAGONIA (4777 FT)(APRSWXNET)         341 PM APR 8      37 MPH


OBSERVATIONS ARE COLLECTED FROM A VARIETY OF SOURCES WITH VARYING
EQUIPMENT AND EXPOSURES. NOT ALL DATA LISTED IS CONSIDERED OFFICIAL. THE
NATIONAL WEATHER SERVICE THANKS ITS PRIVATE AND PUBLIC PARTNERS FOR
PROVIDING US WITH THIS DATA.
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WIND ADVISORY

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URGENT - WEATHER MESSAGE
NATIONAL WEATHER SERVICE TUCSON AZ
1053 PM MST MON APR 8 2013

UPPER SANTA CRUZ RIVER VALLEY/ALTAR VALLEY-TUCSON METRO AREA-
SOUTH CENTRAL PINAL COUNTY-SOUTHEAST PINAL COUNTY-
UPPER GILA RIVER VALLEY-
WHITE MOUNTAINS OF GRAHAM AND GREENLEE COUNTIES-
GALIURO AND PINALENO MOUNTAINS-CATALINA AND RINCON MOUNTAINS-
BABOQUIVARI MOUNTAINS-
INCLUDING THE CITIES OF...NOGALES...TUCSON...GREEN VALLEY...
MARANA...VAIL...PICACHO PEAK STATE PARK...MAMMOTH...ORACLE...
CLIFTON...SAFFORD...HANNAGAN MEADOW...MOUNT GRAHAM...
MOUNT LEMMON...SUMMERHAVEN
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1053 PM MST MON APR 8 2013

...WIND ADVISORY WILL EXPIRE AT 11 PM MST THIS EVENING...

THE WIND ADVISORY WILL EXPIRE AT 11 PM MST THIS EVENING. BREEZY TO LOCALLY WINDY CONDITIONS WILL CONTINUE FOR SEVERAL HOURS BEFORE WINDS DIMINISH IN THE MORNING HOURS.

ZONE FORECAST PRODUCT FOR SOUTHEAST ARIZONA
NATIONAL WEATHER SERVICE TUCSON AZ
1202 AM MST TUE APR 9 2013

TUCSON METRO AREA-
INCLUDING...TUCSON...GREEN VALLEY...MARANA...VAIL
1202 AM MST TUE APR 9 2013

.TODAY...BREEZY. PARTLY CLOUDY. ISOLATED SHOWERS IN THE MORNING... THEN SLIGHT CHANCE OF SHOWERS AND THUNDERSTORMS IN THE AFTERNOON. COOLER. HIGHS 64 TO 69. SOUTHWEST WIND 10 TO 15 MPH BECOMING WEST 15 TO 25 MPH IN THE AFTERNOON. CHANCE OF PRECIPITATION 10 PERCENT.
.TONIGHT...PARTLY CLOUDY. LOWS 42 TO 47. WEST WIND 10 TO 20 MPH BECOMING SOUTHWEST 5 TO 15 MPH AFTER MIDNIGHT.
.WEDNESDAY...MOSTLY SUNNY. HIGHS 67 TO 72. SOUTHWEST WIND 5 TO 10 MPH BECOMING NORTHWEST 10 TO 15 MPH IN THE AFTERNOON.
.WEDNESDAY NIGHT...MOSTLY CLEAR. LOWS 45 TO 50. NORTHWEST WIND 10 TO 15 MPH BECOMING WEST 5 TO 10 MPH AFTER MIDNIGHT.
.THURSDAY...MOSTLY SUNNY. WARMER. HIGHS 76 TO 81. SOUTHEAST WIND AROUND 5 MPH BECOMING WEST IN THE AFTERNOON.
.THURSDAY NIGHT...MOSTLY CLEAR. LOWS 49 TO 54.
.FRIDAY...PARTLY CLOUDY. HIGHS 80 TO 85.
.FRIDAY NIGHT THROUGH MONDAY...MOSTLY CLEAR. LOWS 50 TO 57. HIGHS 80 TO 90.

NOAA Satellite Services Division Smoke/Dust Discussion for April 8, 2013:

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 0130Z April 9, 2013
Gulf of Mexico/Southern Texas:

A massive area of thin density remnant smoke was visible over the Gulf of Mexico this evening. Smoke moved northward throughout the day and was seen moving inland over the Texas gulf coast at sunset. Smoke originated from fires in burning Mexico.

Blowing Sand/Dust:

Southwest US:

A significant blowing dust event was visible in satellite imagery
this evening. A large broad area of blowing sand/dust covered much of
southwest US. Sand/dust originated from multiple sources in northern
Mexico, Arizona, New Mexico, and west Texas.

LP
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.osdpd.noaa.gov/ml/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

Appendix E:
Affidavit of Public Notice