



MONTHLY AIR QUALITY REPORT FOR
SEPTEMBER 2012

AOI COLOR SCALE

GOOD 0-50	MODERATE 51-100	UNHEALTHY FOR SENSITIVE GROUPS 101-150	UNHEALTHY 151-200
	VERY UNHEALTHY 201-300	HAZARDOUS 301-500	

Calendar of maximum AQI values & their corresponding color for September 2012*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

1 (day of month)	O3	CO
	PM10	PM2.5

	SUN	MON	TUES	WED	THU	FRI	SAT
							1 64 07 28 35
2	50 07 91 41	3 48 06 88 49	4 48 07 56 44	5 71 07 30 32	6 46 07 106 38	7 36 08 23 24	8 42 08 29 32
9	43 06 74 47	10 74 08 74 43	11 42 07 19 25	12 74 08 22 28	13 49 09 33 19	14 48 09 35 28	15 67 14 30 43
16	80 18 31 42	17 67 13 40 37	18 71 11 45 40	19 71 13 51 42	20 71 16 49 39	21 64 16 56 42	22 71 18 50 49
23	67 13 44 51	24 47 14 52 48	25 41 13 63 44	26 58 14 55 49	27 47 18 51 49	28 67 06 45 44	29 58 07 35 41
30	71 10 38 42						

Calendar of High Pollution Advisories and Health Watches issued during September 2012

SUN			MON			TUE			WED			THU			FRI			SAT		
																		1		
2		3			4			5			6			7			8			
9		10			11			12			13			14			15			
16		17			18			19			20			21			22			
23		24			25			26			27			28			29			
30																				

LEGEND

HIGH POLLUTION ADVISORIES

- A** = PM-10 High Pollution Advisory
- B** = PM-2.5 High Pollution Advisory
- C** = Ozone High Pollution Advisory

HEALTH WATCHES

- D** = PM-10 Health Watch
- E** = PM-2.5 Health Watch
- F** = Ozone Health Watch

Calendar of Meteorological Conditions observed in Metro Phoenix during September 2012

SUN			MON			TUE			WED			THU			FRI			SAT		
																		1		
2		3			4			5			6			7			8			
9		10			11			12			13			14			15			
16		17			18			19			20			21			22			
23		24			25			26			27			28			29			
30																				

LEGEND

ELECTROMETEORS

- A** = Thunderstorm

HYDROMETEORS

- B** = Rain/Drizzle/Hail/Snow
- C** = Fog

LITHOMETEORS

- D** = Blowing Dust
- E** = Haze (vsby <10SM)
- F** = Smoke

Non-Ozone Exceedance days during SEP 2012-

Total=	1	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
		9/06	106	PM-10	West Chandler

Non-Ozone Health Watches issued during SEP 2012-

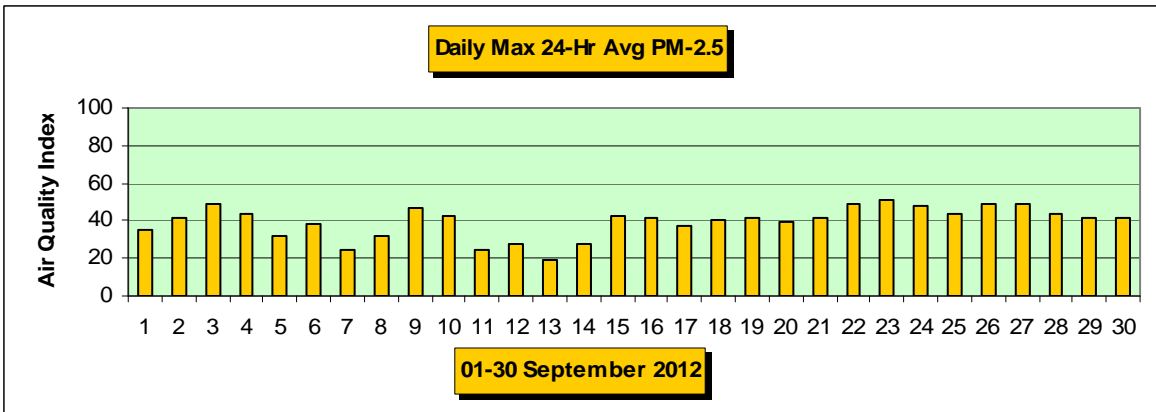
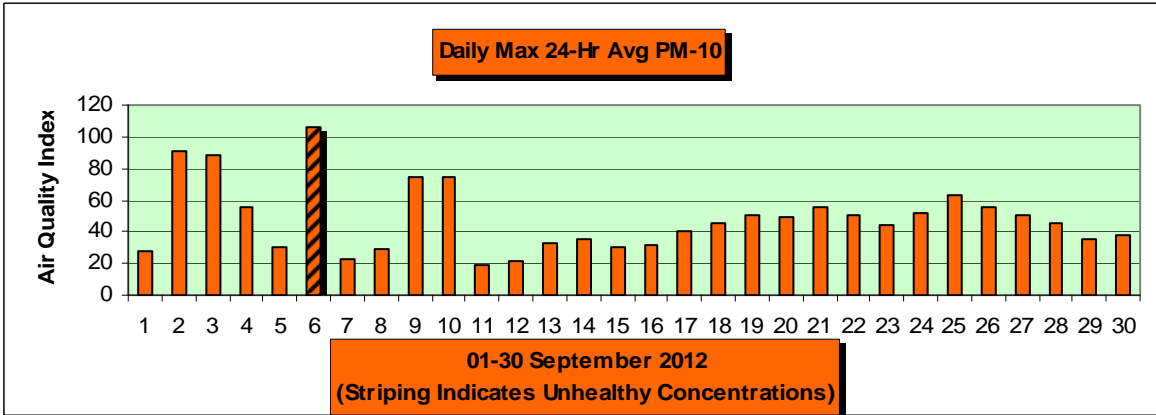
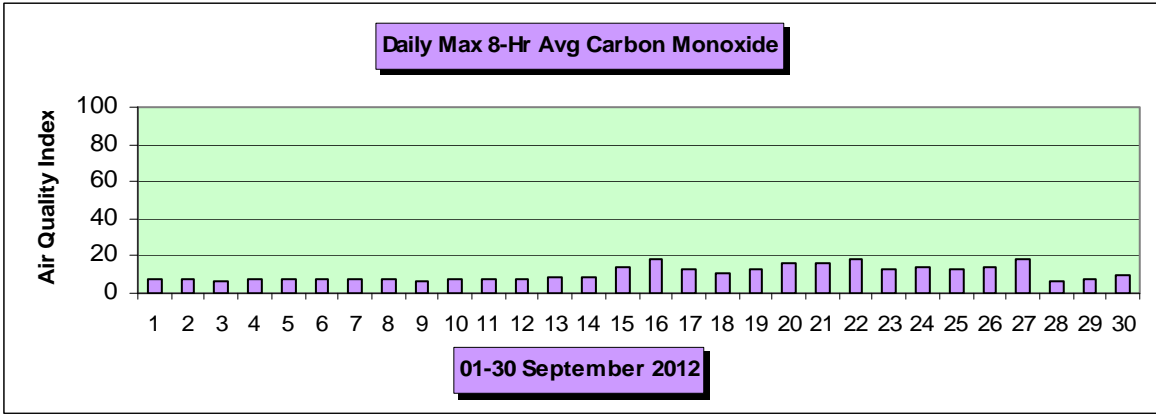
Total=	0	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
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Non-Ozone High Pollution Advisories issued during SEP 2012-

Total=	0	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
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Concentration Recap:

Days in the Good category:	5
Days in the Moderate category:	24
Days in the Unhealthy for Sensitive Groups category:	1
Days in the Unhealthy category:	0
Days in the Very Unhealthy category:	0
Days in the Hazardous category:	0
Total Forecast Days:	30



Narrative: Compared to the previous three months, Valley air quality during September 2012 was much improved...but still not great. Summer monsoon thunderstorm activity persisted thru the 13th of the month after which time a much drier weather pattern occurred as the mid-latitude storm track migrated farther south. During the first two weeks of the month thunderstorm outflow boundary-generated blowing dust events impacted the Phoenix metro area on seven days but unhealthy PM-10 levels occurred on only one of those days – the 6th. On that day a massive wall of dust arrived over the area from the south during the late afternoon hours and resulted in wind gusts of up to 40 mph and visibilities as low as 1 1/4 miles. Images from the local VISNET camera array (**Figures 1-4** below) captured the movement of the dust wall over downtown Phoenix and **Figure 5** shows the PM-10 time series graph for the West Chandler monitoring site – where an Air Quality Index reading of 106 occurred along with a max hourly concentration of over 3,000ug/m3.

Figure 1



[Figure 2](#)



[Figure 3](#)



Figure 4

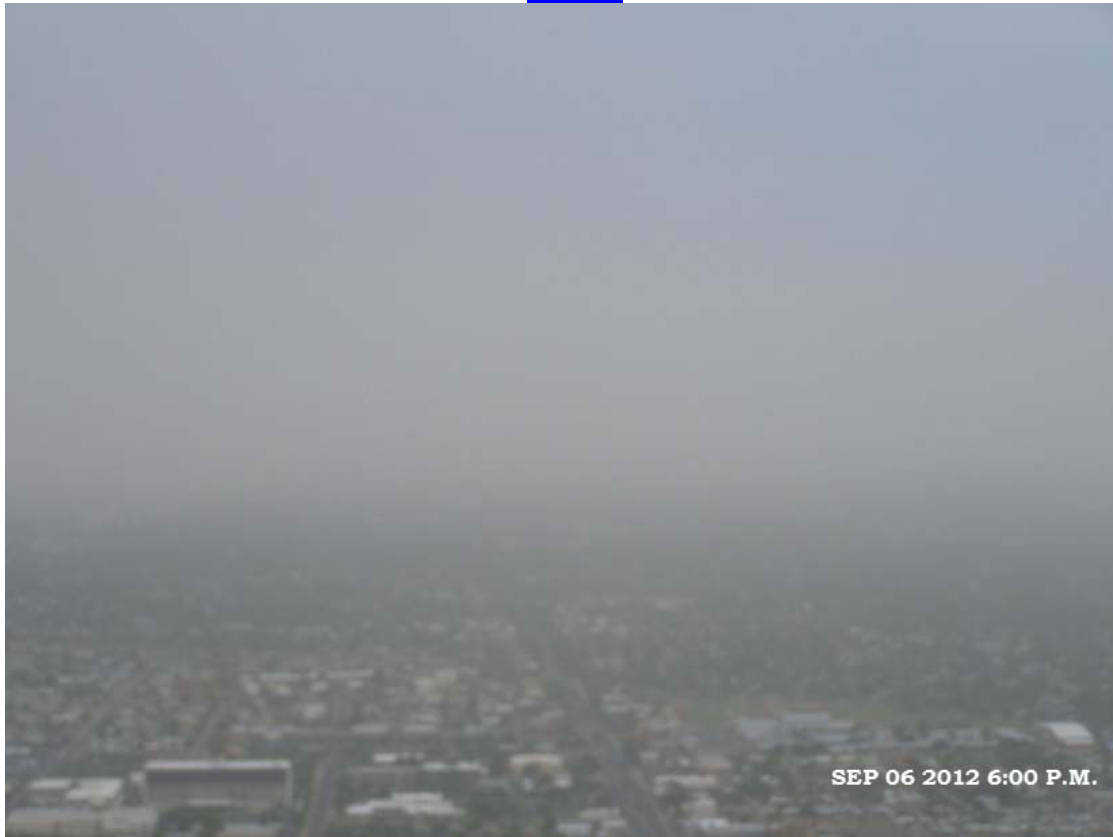
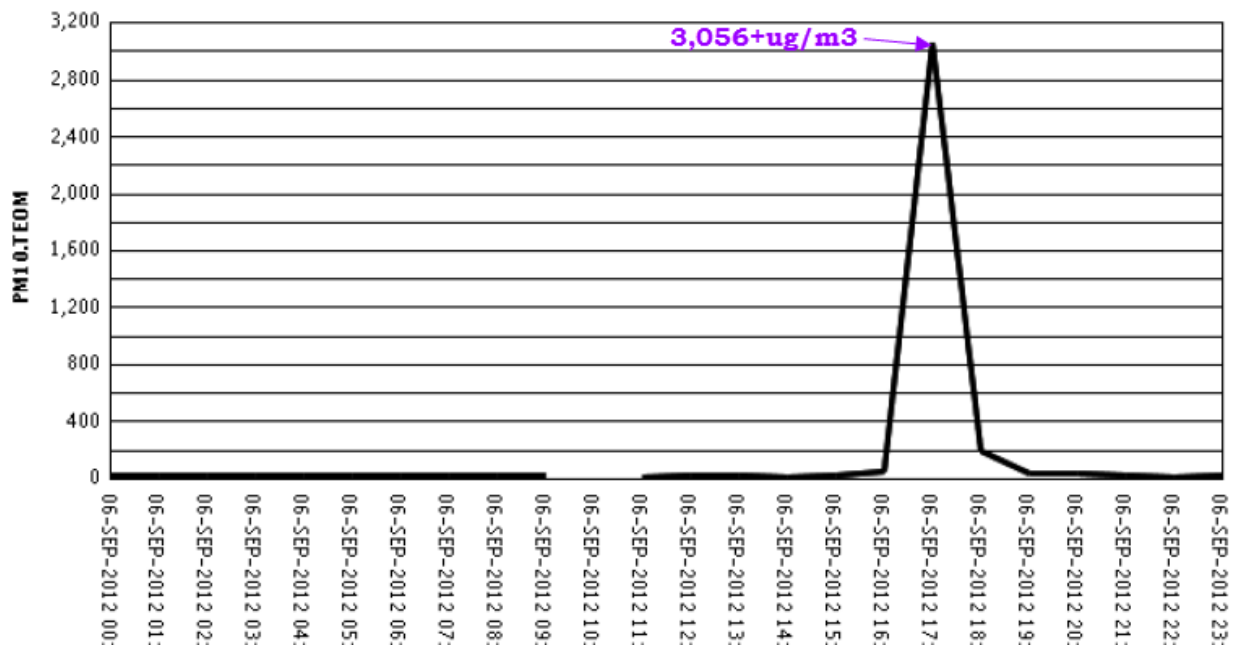


Figure 5

Name: WEST CHANDLER



Although a few more outflow boundary dust events occurred, heavy rainfall on the 7th helped to minimize their severity and peak PM-10 levels rose no higher than the mid-moderate range of the Air Quality Index for the remainder of the month.

During the 2012 summer monsoon an uncomfortably large number of blowing dust episodes affected the Valley and a summary of these events was conducted by the National Weather Service Forecast Office in Phoenix and can be seen below.

As the 2012 Monsoon comes to a close, we take a look back at the notable Dust Storms from the summer. Dust storms have gained more attention and seem to have larger areas of impact than some may think. The fact that the areal coverage, distance traveled and intensity can hold together for such a long amount of time is incredible. So, how does the 2012 Monsoon look for Dust Storms?

Incorporating warnings issued throughout 2012 as a whole, not just during the Monsoon, the National Weather Service (NWS) as an office issued 17 Dust Storm warnings (as of September 10). This spans our entire County Warning Area (CWA) including Southeast California. When a Dust Storm Warning is issued, criteria of 1/4 mile visibility or less is required. Spotter reports from the public, law enforcement and trained spotters greatly help to verify ground truth of visibility during severe weather events, and at times, is the only way to know how low the visibility is. The number of local storm reports (LSR) received for 2012 for dust storm criteria (visibility of 1/4 mile or less) so far has been 60. The correlation between how severe a dust storm is compared with how many reports and the lowest visibility in a report is hard to connect. Some events that span a large area, both in areal coverage of a warning and the area that the dust travels, may only have a few LSR's associated with them. On the other hand, some short lived dust storms, both in time duration and areal coverage may have numerous reports associated with it. To classify the biggest, longest time duration, and largest areal coverage for dust storms is tough, and subjective.

During 2012, 17 Dust Storm Warnings were issued, with 16 days that dust storms reported were reported, across the entire CWA. 14 of those days occurred during the Monsoon. Defining one dust storm from another is tricky, especially if the same dust storm impacts multiple areas. Individual days that had dust storms reported were as follows (including non-Monsoon days): Feb 27, May 9, Jun 16, Jun 27, Jul 21 (two on this day), Jul 22, Jul 23, Jul 28, Jul 29, Jul 31, Aug 5, Aug 11, Aug 13, Sep 2, Sep 6, Sep 9.



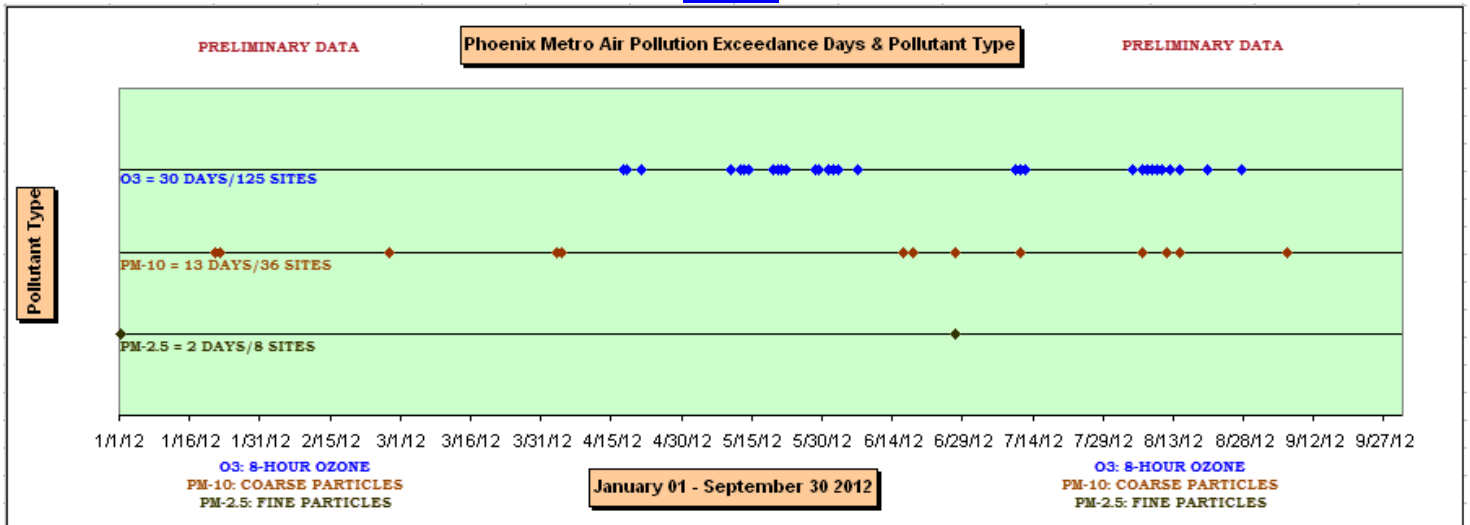
Local weather conditions and air quality issues during the remainder of the month were uneventful although warm air aloft – combined with cooler morning temperatures due to less cloud cover, drier air, and longer nights – led to surface-based radiation inversion formation from the 16th onward. The strength of these inversions peaked on the 22nd and 23rd and on the morning of the 24th a layer of trapped particle pollution could be seen over downtown Phoenix as evidenced by the VISNET camera array photo shown in [Figure 6](#). The elevated PM-10 (coarse) and PM-2.5 (fine) particle AQI levels recorded during the remainder of the month were contributed to by this type of inversion.

Figure 6



The graph shown in [Figure 8](#) shows the Phoenix metro air pollution exceedance timeline for 2012 thru the month of September. -Reith

Figure 7



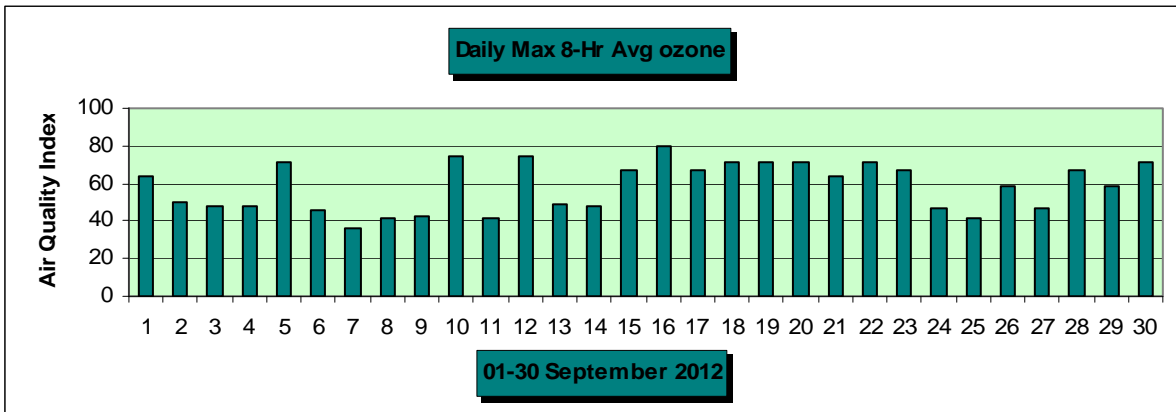
DETAILED OZONE SECTION
 (Based on the 2008 EPA Revised 8-Hour Ozone Standard)

GOOD 0-50	MODERATE 51-100	UNHEALTHY FOR SENSITIVE GROUPS 101-150	UNHEALTHY 151-200
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SUMMARY OF MAXIMUM 8-HR OZONE AQI VALUES FOR SEPTEMBER 2012*

*Preliminary data

SUN		MON		TUES		WED		THU		FRI		SAT	
												1	64
2	50	3	48	4	48	5	71	6	46	7	36	8	42
9	43	10	74	11	42	12	74	13	49	14	48	15	67
16	80	17	67	18	71	19	71	20	71	21	64	22	71
23	67	24	47	25	41	26	58	27	47	28	67	29	58
30	71												



8-hr Ozone exceedance days in SEP: Total= 0 Date Max ppb/AQI Site/s

Total number of exceedance days since APR 01: 30
Total number of exceedance sites since APR 01: 125

Ozone Health Watches in SEP: Total= 3 Date Max ppb/AQI Site/s
 (Forecast max value 72-75 ppb)

	9/13	58/49	Queen Valley
	9/18	66/71	Humboldt Mtn. North Phoenix South Phoenix
	9/19	66/71	North Phoenix South Phoenix

Ozone Health Watches since APR 01: Total= 36

High Pollution Advisories in SEP: Total= 0 Date Max ppb/AQI Site/s
 (Forecast max value 76+ppb)

High Pollution Advisories since APR 01: Total= 8

Concentration Recap:

Days in the Good category:	13
Days in the Moderate category:	17
Days in the Unhealthy for Sensitive Groups category:	0
Days in the Unhealthy category:	0
Total Forecast Days:	30

Maximum 8-Hr value: Date Hour Site ppb/AQI DOW
 9/16 1200 Queen Valley 69/80 Sun

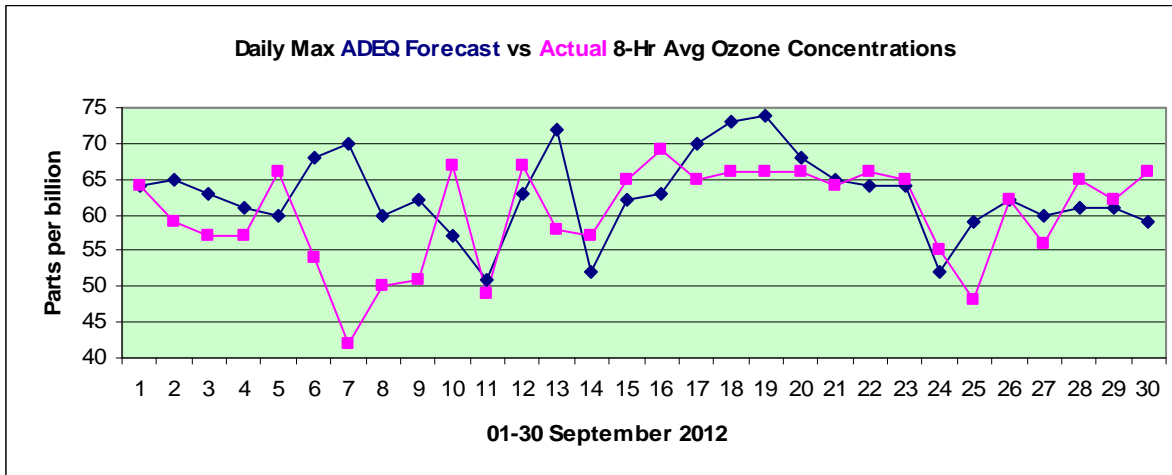
Maximum 1-Hr value: Date Hour Site ppb/AQI DOW
 9/16 1600 Blue Point 86/72 Sun

Average daily max 8-Hr concentration (ppb): 60.1
 Deviation from the 1996-2011 average (ppb): **-1.8**

SEP Climatology: Average number of 8-Hr exceedance days: 0.5
 (Period 1996-2007 Maximum number of 8-Hr exceedance days: 3 in 2010
 using 1997 85ppb Minimum number of 8-Hr exceedance days: 0 in 1996, 1998, 2000-09
 standard & 2008- Average daily max 8-Hr concentration (ppb): 61.9
 2011 using 76ppb Record high max 8-Hr concentration (ppb): 91 on the 4th, 1997
 standard) Record low max 8-Hr concentration (ppb): 36 on the 14th, 2009

Forecast Verification:

# of days maximum concentrations were over-forecast:	18
# of days maximum concentrations were under-forecast:	10
# of days maximum concentrations were correctly forecast:	2
September average forecast accuracy (ppb):	+/-6.2
September average forecast bias (ppb):	+3.4



Narrative: Although afternoon high temperatures in the Phoenix metro area reached at least 100 degrees F on 16 days during the month, local ozone levels still dropped off significantly and this is typical due to lower sun-angles and shorter day-lengths. September 30 marks the end of the unofficial ozone season for the Valley and the mean daily maximum ozone concentration for the month was just below the running 16-year average. –Reith