



**MONTHLY AIR QUALITY REPORT FOR
APRIL 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 April 2012*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

	SUN	MON	TUES	WED	THU	FRI	SAT						
1	49 03 60 34	2	51 03 61 12	3	54 07 268 17	4	67 09 121 31	5	71 14 51 28	6	97 06 49 39	7	84 09 45 46
8	77 13 44 52	9	67 09 53 62	10	48 11 55 44	11	42 02 50 28	12	64 02 29 21	13	100 06 86 43	14	47 03 42 18
15	61 05 26 23	16	77 07 37 26	17	106 14 45 35	18	106 13 43 38	19	80 07 47 30	20	77 08 48 31	21	101 15 51 36
22	97 17 46 37	23	84 13 51 37	24	97 06 34 30	25	74 07 58 47	26	47 07 53 23	27	90 06 34 22	28	100 08 38 30
29	74 05 35 28	30	67 06 38 33										

Calendar of High Pollution Advisories and Health Watches issued during April 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		F	19		F	20			21		F
22		F	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 April 2012

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

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 APR 2012-

Total=	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
2	4/03	268	PM-10	West Chandler
	4/04	121	PM-10	Wes Chandler

Non-Ozone Health Watches issued during APR 2012-

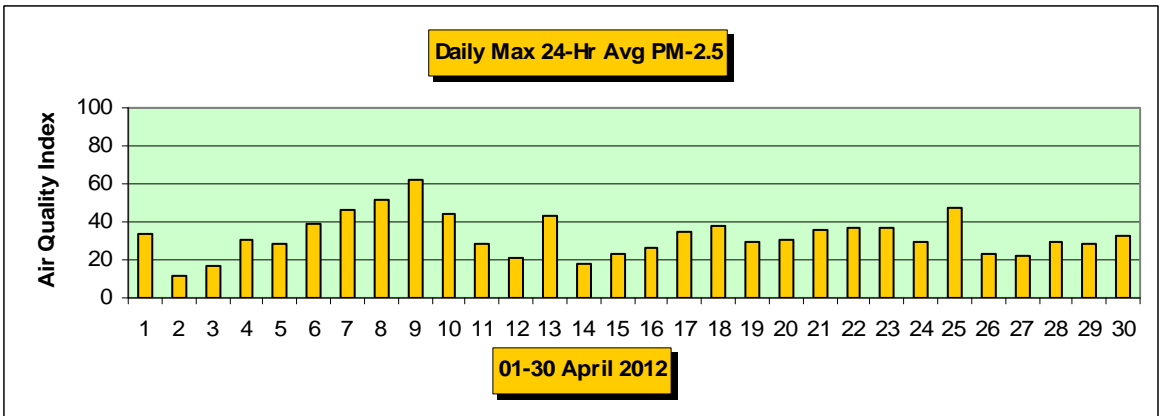
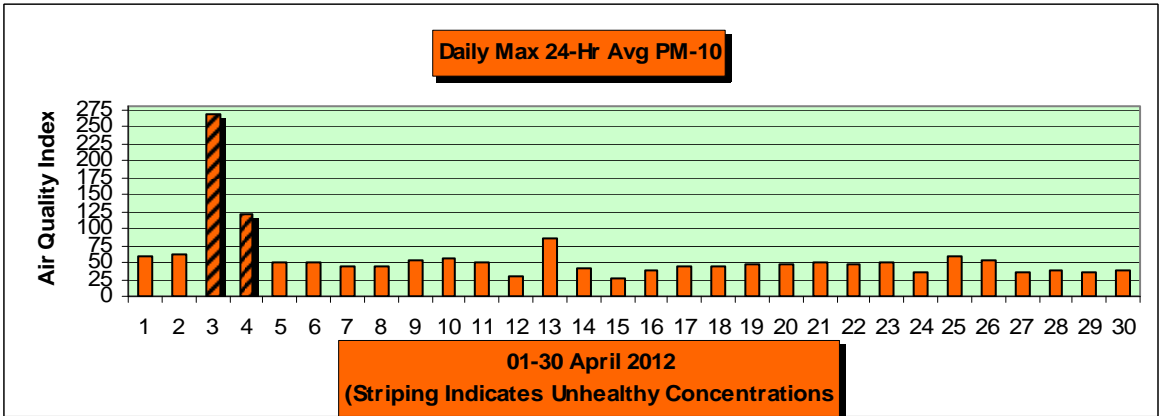
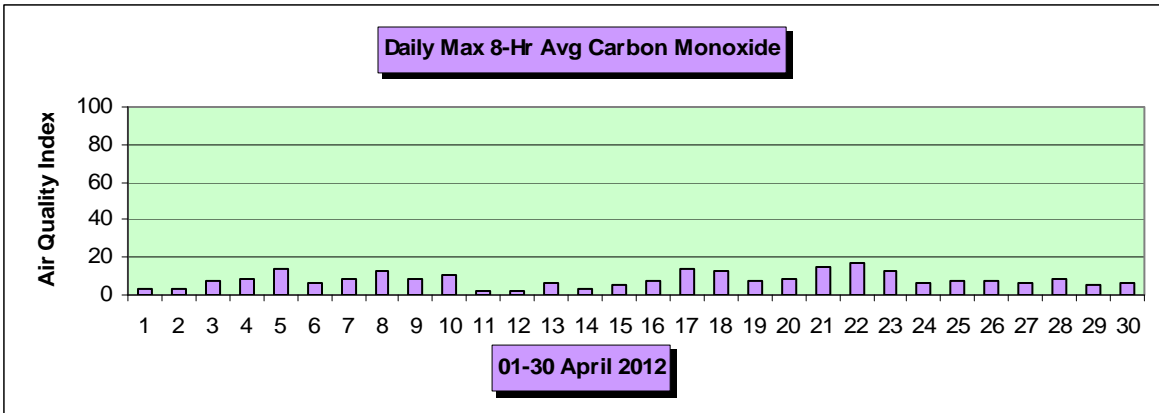
Total=	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
0				

Non-Ozone High Pollution Advisories issued during APR 2012-

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

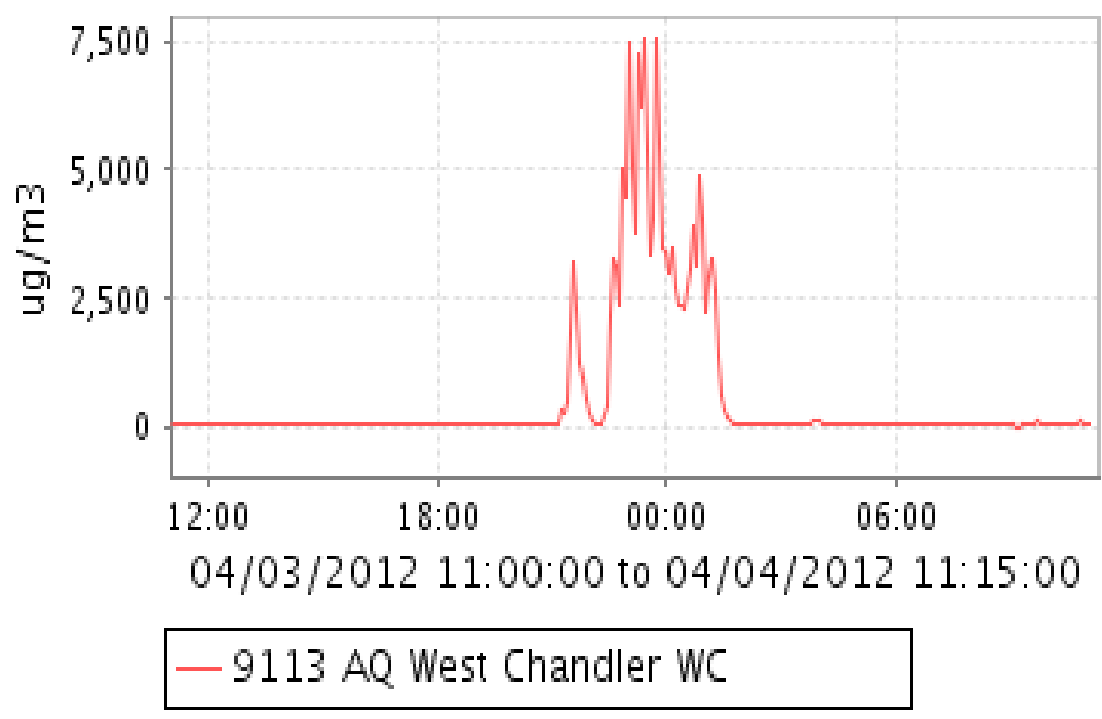
Concentration Recap:

Days in the Good category:	2
Days in the Moderate category:	23
Days in the Unhealthy for Sensitive Groups category:	4
Days in the Unhealthy category:	0
Days in the Very Unhealthy category:	<u>1</u>
Total Forecast Days:	30



Narrative: The month of April 2012 began with a dry frontal passage that occurred on the 1st followed by the arrival of a major short-wave trough in the mid-latitude storm track on the 2nd. Gradient winds gusted to 33 mph on the 1st and 37 mph on the 2nd and some blowing dust was reported that day as well. Even so, highest PM-10 (coarse particle) levels both days were only in the low-moderate range of the Air Quality Index. Unfortunately, back-to-back PM-10 exceedances then occurred at the same location on the 3rd and 4th that were not directly tied to any significant weather phenomenon. Figure 1 below is the 24-hour PM-10 time-series graph from the West Chandler monitoring site beginning at noon on the 3rd and it shows incredibly high PM-10 concentrations during the overnight period. Highest hourly concentrations reached 5,036ug/m3 at 11:00 pm on the 3rd and 3,097ug/m3 at midnight on the 4th. Much lower PM-10 levels both before and after these readings were unable to compensate for such high concentrations and resulted in a 24-hour average in the Unhealthy range of the AQI on the 3rd and in the Unhealthy for Sensitive Groups range on the 4th. It appears likely that this incident was the result of large amounts of dust produced by unsupervised agricultural field plowing during the overnight hours. -Reith

Figure 1



The mid-latitude storm track remained quite active over the western U.S. thru the first two weeks of the month and the synoptic weather pattern from the 5th thru the 14th featured a large and deep upper level trough whose axis was west of the Phoenix metro area until about the 10th. On the 11th this feature (Figure 2) began to approach Arizona and on the 13th arrived overhead followed by a surface cold frontal passage on the 14th. Although minor periods of blowing dust were reported in the Valley from the 10th thru the 13th, highest wind gusts (38 mph), lowest visibilities in blowing dust (six miles), and most serious PM-10 levels (upper moderate range of the AQI) occurred on the 13th. Fortunately, rainfall occurred in the Valley the next day and this – along with rainfall from a second moist system late in the month – helped to keep local PM-10 levels low during the remainder of the month.

Figure 3

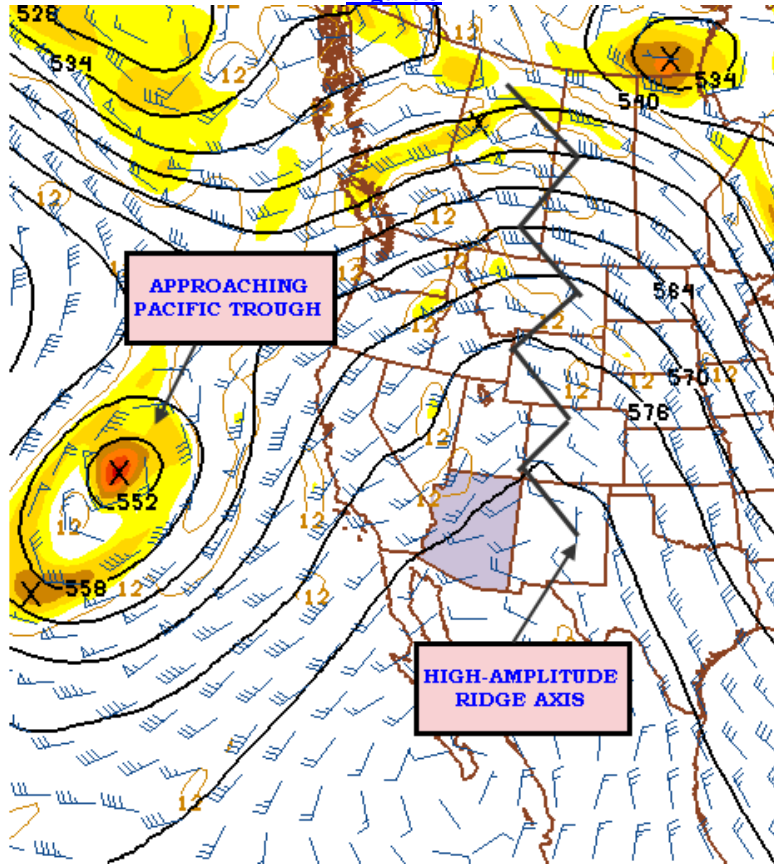
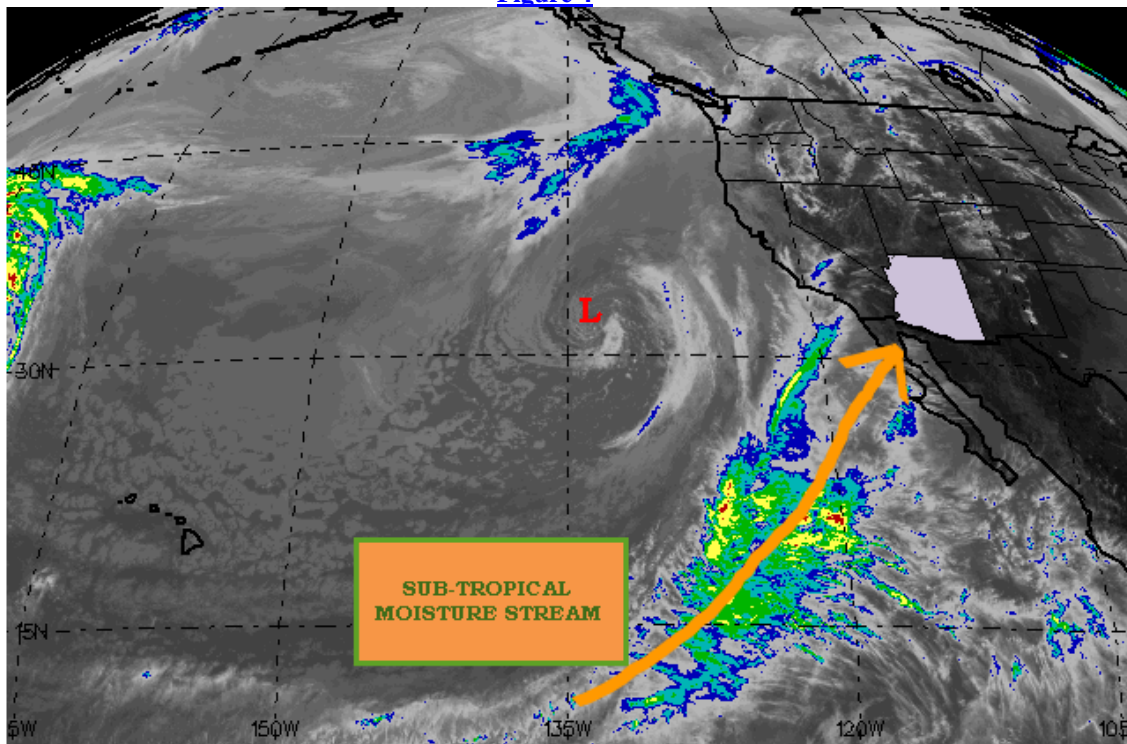


Figure 4



[Figure 5](#)



[Figure 6](#)



DETAILED OZONE SECTION

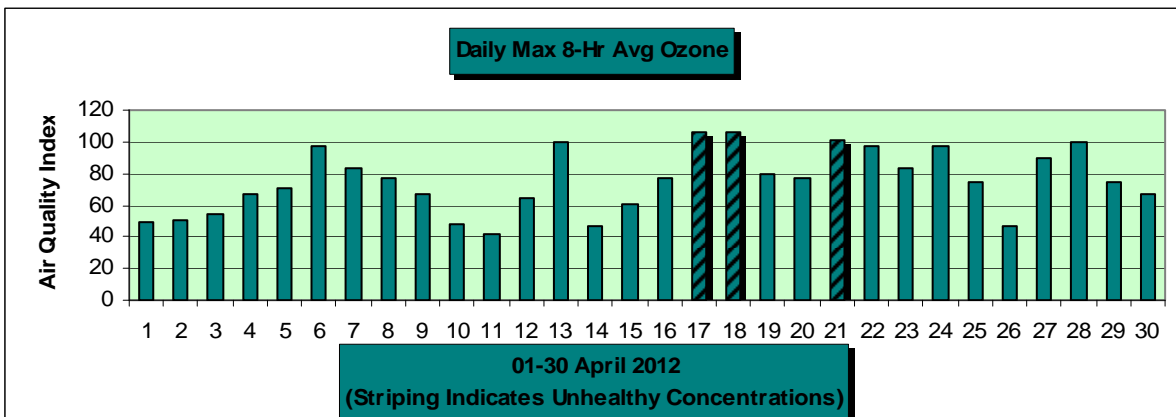
(Based on the 2008 EPA Revised 8-Hour Ozone Standard)

GOOD	MODERATE	UNHEALTHY FOR SENSITIVE GROUPS	UNHEALTHY
0-50	51-100	101-150	151-200

SUMMARY OF MAXIMUM 8-HR OZONE AQI VALUES FOR APRIL 2012*

*Preliminary data

SUN		MON		TUES		WED		THU		FRI		SAT	
1	49	2	51	3	54	4	67	5	71	6	97	7	84
8	77	9	67	10	48	11	42	12	64	13	100	14	47
15	61	16	77	17	106	18	106	19	80	20	77	21	101
22	97	23	84	24	97	25	74	26	47	27	90	28	100
29	74	30	67										



8-hr Ozone exceedance days in APR:	Total= 3	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		4/17	78/106	Humboldt Mtn.
		4/18	78/106	Humboldt Mtn.
		4/21	76/101	North Phoenix

Total number of exceedance days since APR 01: 3
Total number of exceedance sites since APR 01: 3

Ozone Health Watches in APR: (Forecast max value 72-75 ppb)	Total= 4	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		4/18	78/106	Humboldt Mtn.
		4/19	69/80	Tonto Nat'l Mon
		4/20	68/77	North Phoenix
		4/22	74/97	Tonto Nat'l Mon

Ozone Health Watches since APR 01: Total= 4

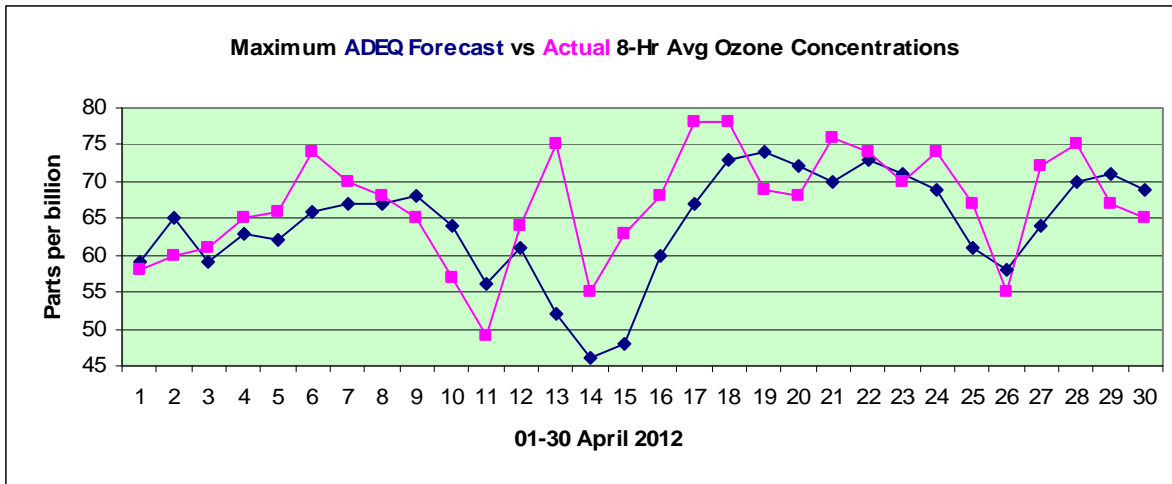
High Pollution Advisories in APR: (Forecast max value 76+ppb)	Total= 0	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
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High Pollution Advisories since APR 01: Total= 0

Concentration Recap:	Days in the Good category:	5			
	Days in the Moderate category:	22			
	Days in the Unhealthy for Sensitive Groups category:	3			
	Days in the Unhealthy category:	0			
	Total Forecast Days:	30			
Maximum 8-Hr value:	<u>Date</u>	<u>Hour</u>	<u>Site</u>	<u>ppb/AQI</u>	<u>DOW</u>
	4/17	1800	Humboldt Mtn.	78/106	Tue
	4/18	1100	Humboldt Mtn.	78/106	Wed
Maximum 1-Hr value:	<u>Date</u>	<u>Hour</u>	<u>Site</u>	<u>ppb/AQI</u>	<u>DOW</u>
	4/17	1700	Cave Creek	84/70	Tue
	4/22	1500	Cave Creek	84/70	Sun
	Average daily max 8-Hr concentration (ppb):	66.9			
	Deviation from the 1996-2011 average (ppb):	+1.5			

APR Climatology: (Period 1996-2007 using 1997 85ppb standard & 2008-2011 using 76ppb standard)	Average number of 8-Hr exceedance days:	0.5
	Maximum number of 8-Hr exceedance days:	3 in 2008
	Minimum number of 8-Hr exceedance days:	0 in 1997, 2001-07, 10-11
	Average daily max 8-Hr concentration (ppb):	65.4
	Record high max 8-Hr concentration (ppb):	99 on the 29th, 1996
	Record low max 8-Hr concentration (ppb):	40 on the 14th, 2003

Forecast Verification:	# of days maximum concentrations were over-forecast:	11
	# of days maximum concentrations were under-forecast:	19
	# of days maximum concentrations were correctly forecast:	0
	Apr average forecast accuracy (ppb):	+/-5.6
	Apr average forecast bias (ppb):	-2.7



Narrative: April 2012 saw some typical and not so typical events in relation to ozone pollution levels in the Phoenix metro area. Identified as typical were the upward spikes in ozone concentrations that coincided or followed a period during which winds in the 5-10K' layer were from the west or northwest. For several years this wind-flow vector has been considered conducive to the transport of additional ozone and/or its precursors from sources to the west and this theory has been borne out on numerous occasions. An example of this type of wind-flow can be seen in [Figure 1](#). During April 2012 the strongest local signatures of this purported transport occurred between the 11th and the 13th and from the 26th to the 27th. During these periods highest local ozone levels increased dramatically and coincided with upper level trough and surface frontal passages from the west along with weather conditions not normally conducive to ozone increases (gusty winds, cloud cover, precipitation, and cooler temperatures). Not seen as typical for April based on data from 1996-2011 were the number of high ozone days and higher than average monthly ozone concentrations clearly evident in [Figure 2](#). Whether or not this trend continues into later months of the ozone season remains to be seen. A summary of PM-10 (coarse particles), PM-2.5 Fine particles), and O3 (Ozone) AQI levels for the entire month can be seen in [Figure 3](#). -Reith

Figure 1

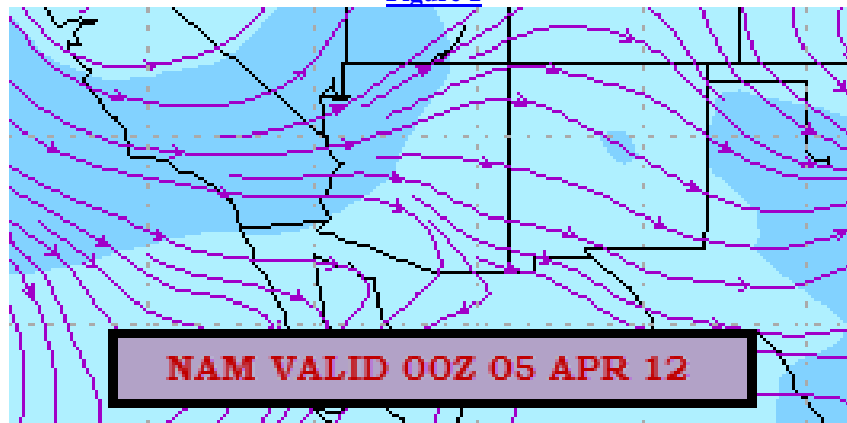


Figure 2

Phoenix Metro April Ozone (ppb)			
YEAR	30-day avg	YEAR	Days 76+ppb
2000	71.6	2000	9
1999	68.9	1996	5
1996	68.5	1999	5
1998	66.9	1997	4
2001	66.9	2001	4
2012	66.9	2005	4
1997	65.8	2008	3
2004	65.8	2012	3
2005	65.8	1998	2
2007	65.5	2002	1
2008	65.5	2003	1
2009	63.7	2004	1
2006	63.4	2006	1
2003	63.2	2009	1
2002	62.4	2007	0
2011	62.4	2010	0
2010	60.5	2011	0
2012 Rank = tied 4th		2012 Rank = tied 4th	

Figure 3

