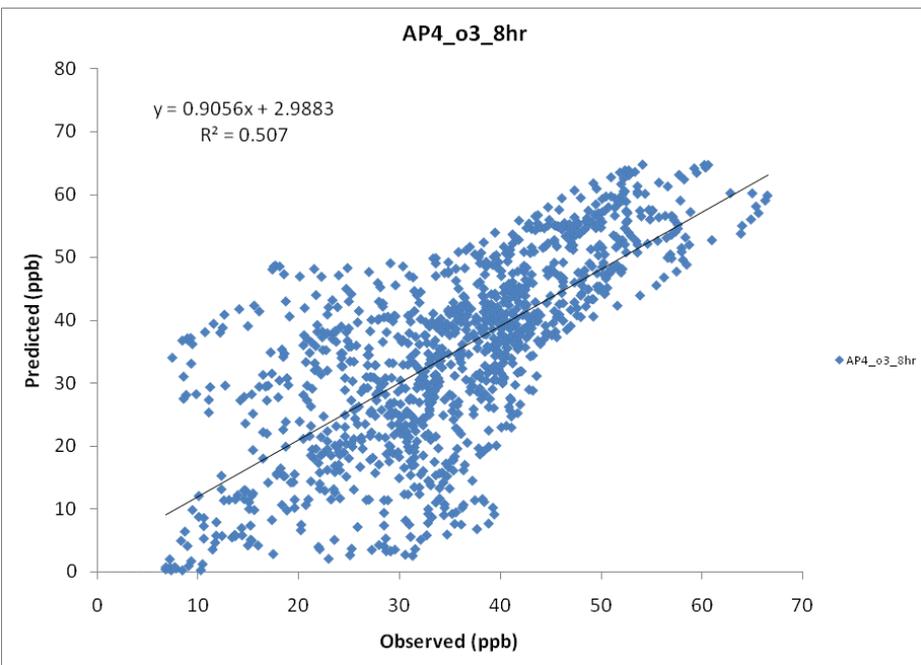
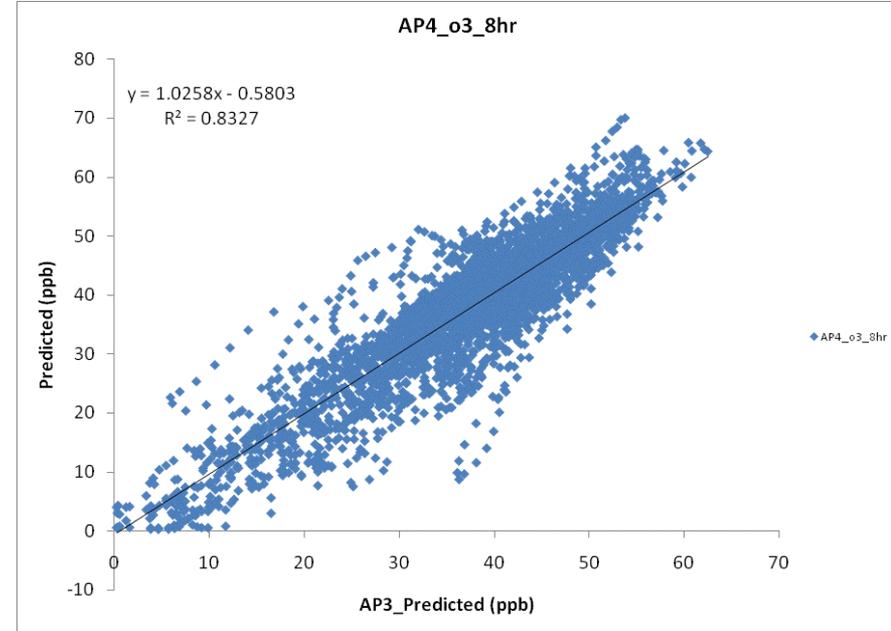
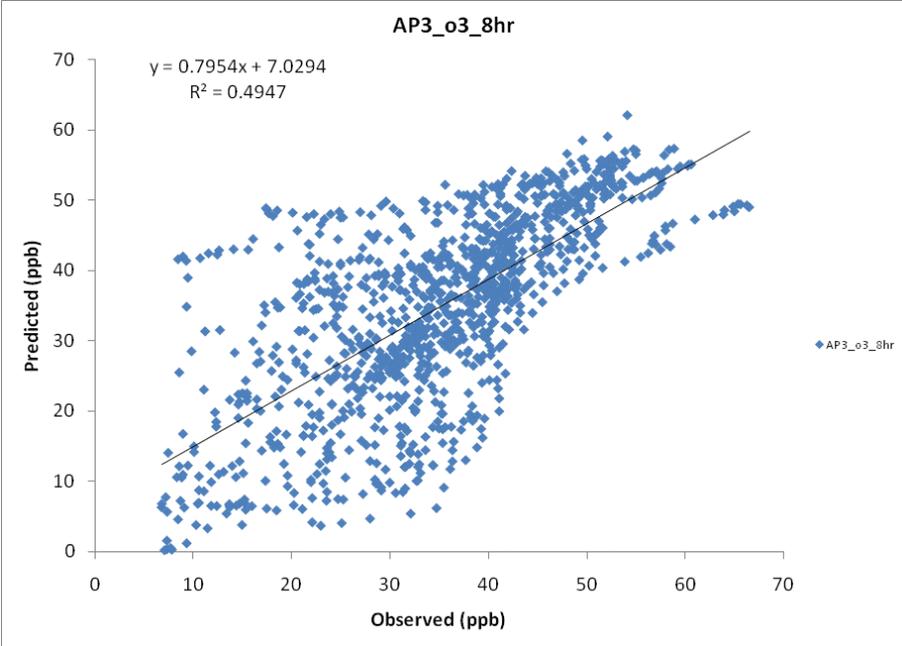


Airpact-3 and Airpact-4 performance for PM2.5



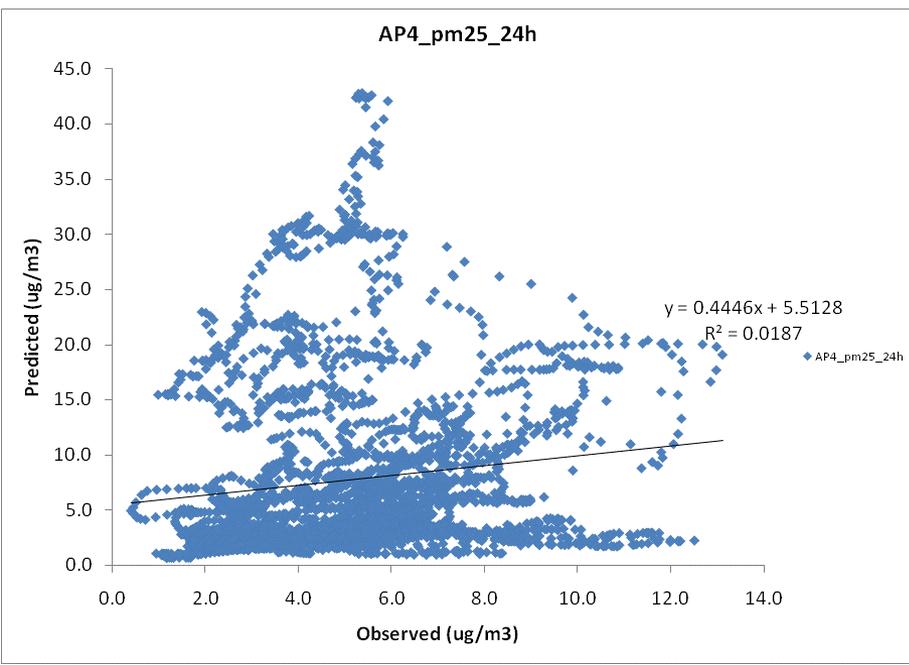
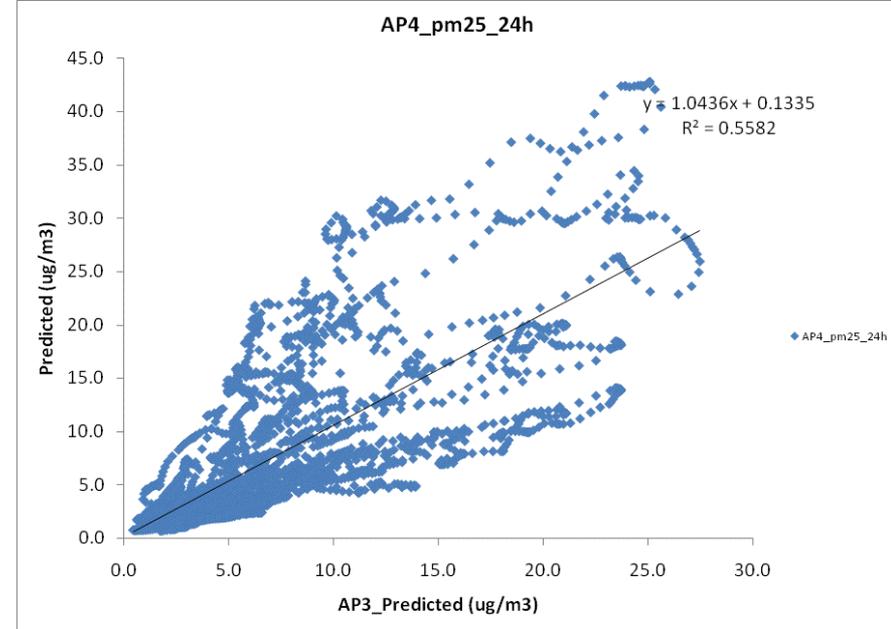
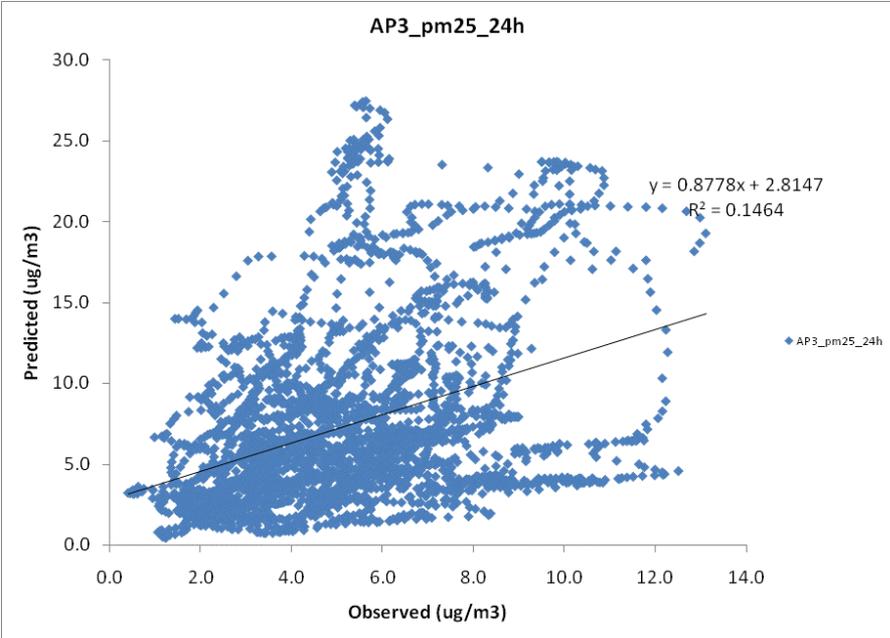
Predicted vs Observed 8 hr O3 May 3-10, 2012

ID, OR, and WA selected sites

Top left: Airpact-3 (AP3) 12 km grids

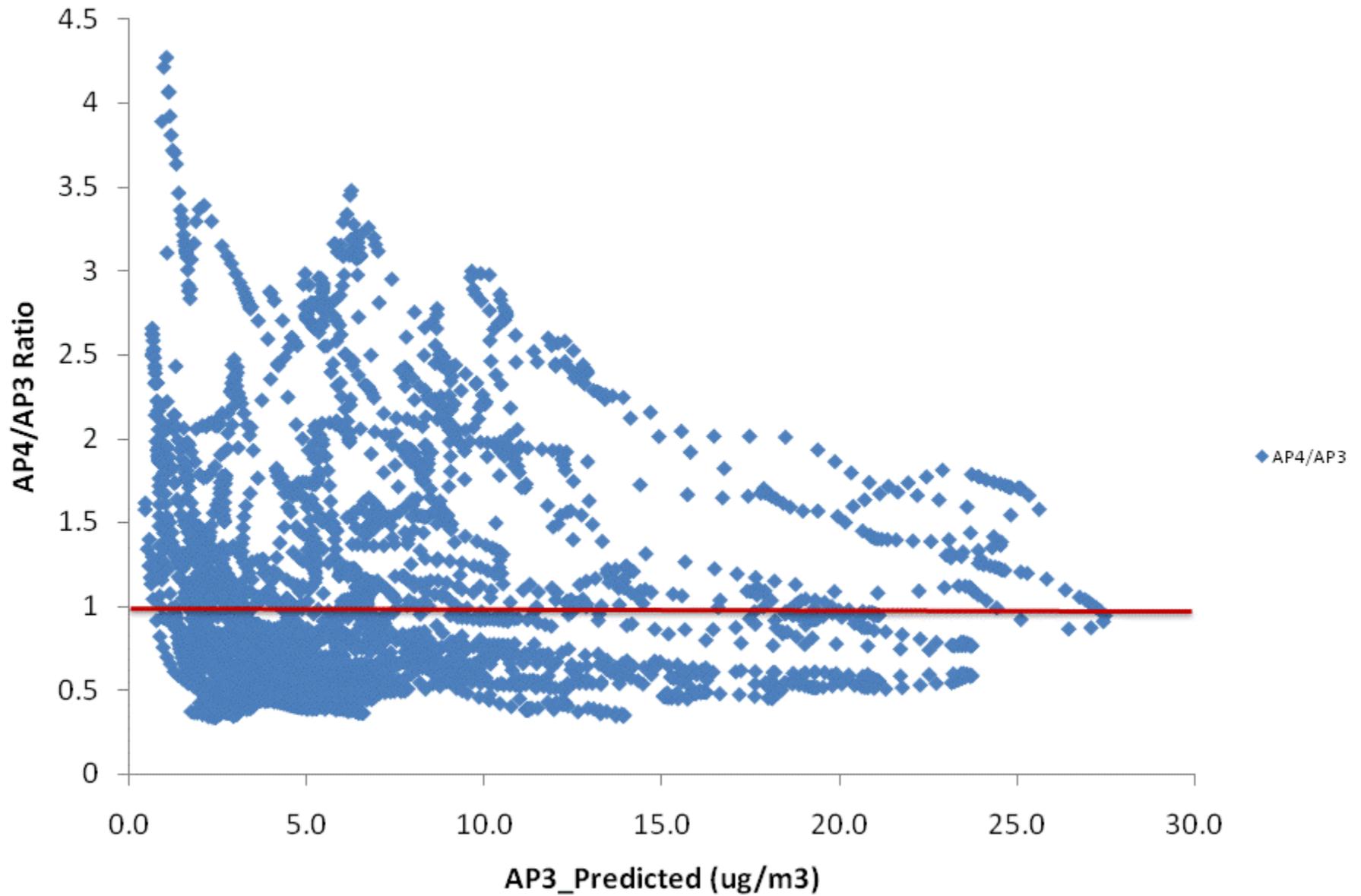
Bottom left: Airpact-4 (AP4) 4 km grids

Top right: AP4 vs AP3



Predicted vs Observed 24 hr PM2.5
May 3-10, 2012
ID, OR, and WA selected sites
Top left: Airpact-3 (AP3) 12 km grids
Bottom left: Airpact-4 (AP4) 4 km grids
Top right: AP4 vs AP3

AP4/AP3

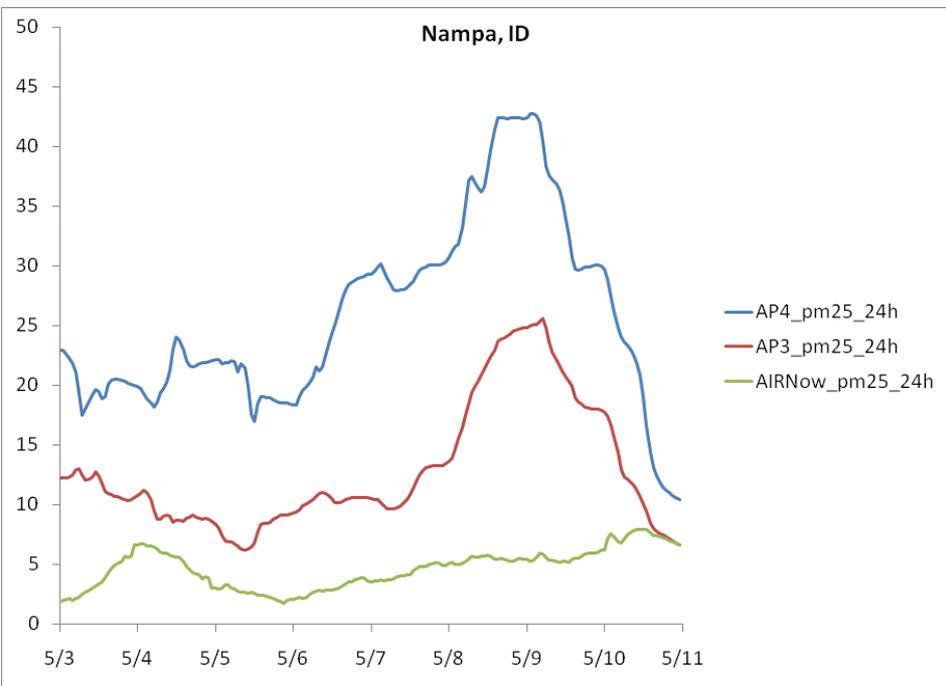
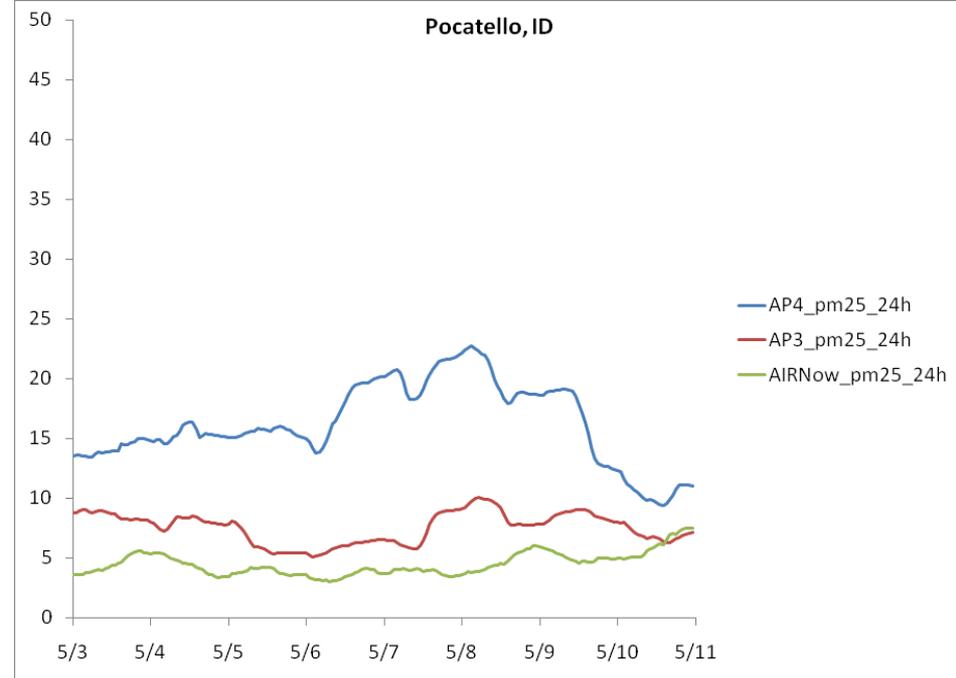
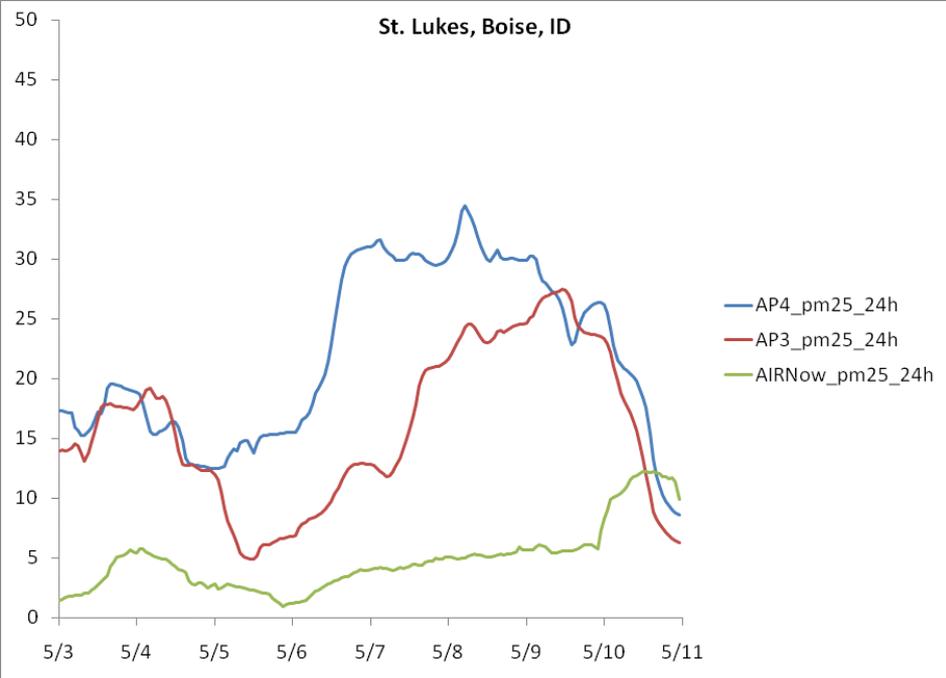


Mean 24 hr PM2.5 concentrations ranked by AP4/AIRNOW ratio
 May 3 – 10, 2012

Location	Parameter	AP4_pm25_24h	AP3_pm25_24h	AIRNow_pm25_24h	AP4/Airnow	AP3/Airnow	AP4/AP3
Nampa, ID	mean	25.8	12.9	4.6	5.6	2.8	2.0
St Lukes Boise	mean	21.9	16.0	4.9	4.5	3.3	1.4
Pocatello	mean	16.3	7.5	4.5	3.6	1.7	2.2
Medford, OR	mean	9.4	4.7	5.5	1.7	0.9	2.0
Seattle, South Park, WA	mean	13.4	13.9	8.2	1.6	1.7	1.0
Moscow, ID	mean	6.1	4.6	3.9	1.6	1.2	1.3
Seattle, Beacon Hill, WA	mean	8.8	13.9	5.7	1.5	2.4	0.6
Portland, Lafayette OR	mean	7.2	11.8	5.2	1.4	2.3	0.6
Tacoma_L	mean	5.8	10.9	5.8	1.0	1.9	0.5
Vancouver 4th, WA	mean	4.6	8.7	4.5	1.0	1.9	0.5
Portland, Sauvie Is	mean	3.9	4.4	4.0	1.0	1.1	0.9
Spokane, Monroe St, WA	mean	4.0	5.9	4.3	0.9	1.4	0.7
Pullman, WA	mean	4.0	4.5	4.3	0.9	1.0	0.9
Darrington, WA	mean	1.6	3.3	2.7	0.6	1.3	0.5
Klamath Falls, OR	mean	3.5	4.3	6.0	0.6	0.7	0.8
Yakima, WA	mean	2.4	4.4	4.2	0.6	1.0	0.5
LaGrande, OR	mean	2.4	2.7	5.0	0.5	0.5	0.9
Plummer, ID	mean	2.7	3.7	5.7	0.5	0.6	0.7
Pinehurst, ID	mean	1.9	3.7	8.2	0.2	0.5	0.5

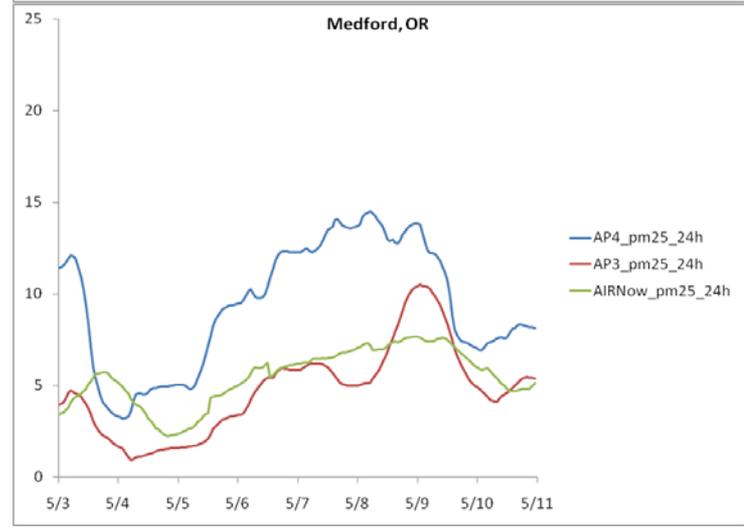
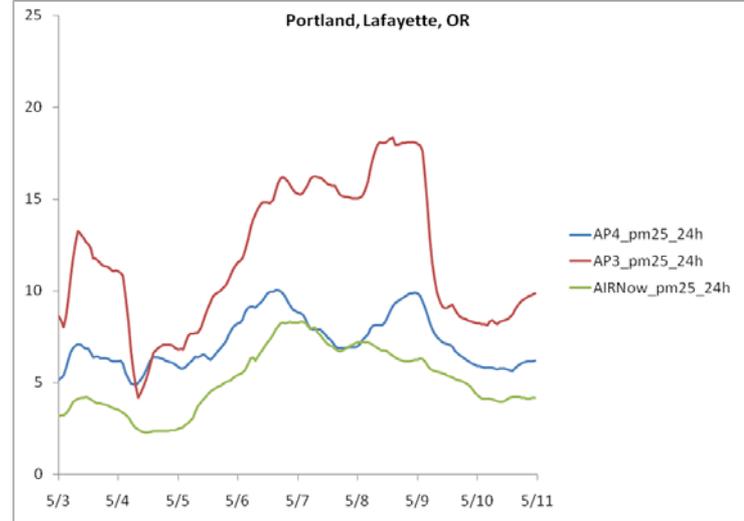
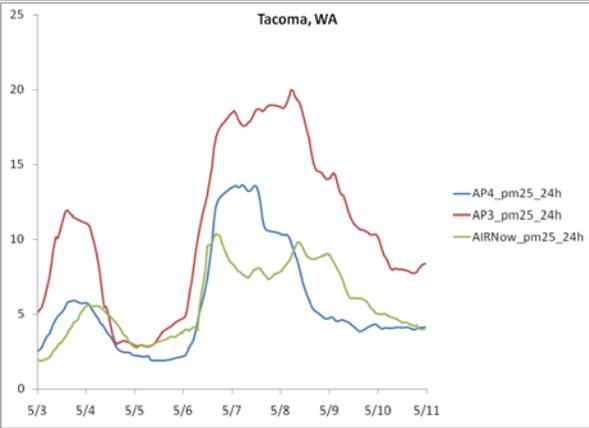
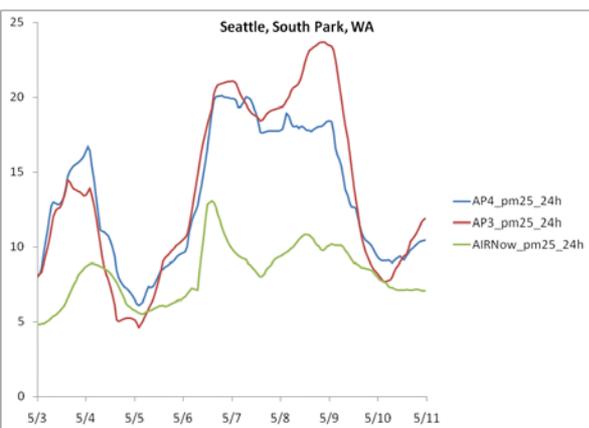
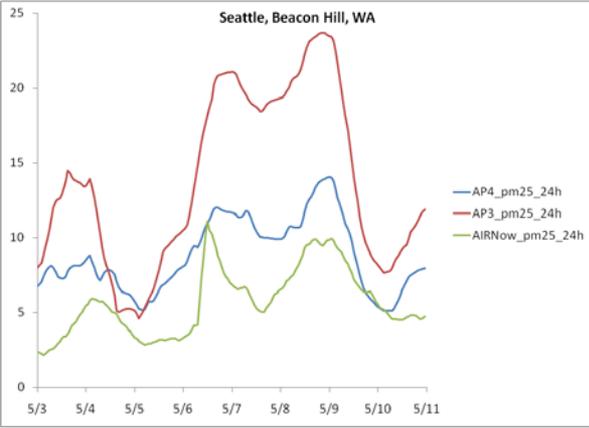
Max 24 hr PM2.5 concentrations ranked by AP4/AIRNOW ratio
 May 3 – 10, 2012

Location	Parameter	AP4_pm25_24h	AP3_pm25_24h	AIRNow_pm25_24h	AP4/Airnow	AP3/Airnow	AP4/AP3
Nampa, ID	max	42.8	25.6	8.0	5.4	3.2	1.7
Pocatello	max	22.7	10.1	7.5	3.0	1.3	2.3
St Lukes Boise	max	34.5	27.5	12.3	2.8	2.2	1.3
Medford, OR	max	14.5	10.5	7.7	1.9	1.4	1.4
Seattle, South Park, WA	max	20.1	23.7	13.1	1.5	1.8	0.8
Moscow, ID	max	11.0	7.5	8.4	1.3	0.9	1.5
Seattle, Beacon Hill, WA	max	14.1	23.7	11.1	1.3	2.1	0.6
Tacoma_L	max	13.7	20.0	10.4	1.3	1.9	0.7
Portland, Lafayette OR	max	10.0	18.4	8.3	1.2	2.2	0.5
Pullman, WA	max	7.4	7.1	7.4	1.0	1.0	1.0
Portland, Sauvie Is	max	6.5	7.2	6.8	1.0	1.0	0.9
Spokane, Monroe St, WA	max	6.3	8.7	9.0	0.7	1.0	0.7
Vancouver 4th, WA	max	6.3	14.0	9.3	0.7	1.5	0.4
Klamath Falls, OR	max	6.6	8.4	10.1	0.7	0.8	0.8
Yakima, WA	max	3.9	6.9	6.6	0.6	1.0	0.6
Darrington, WA	max	2.4	6.6	4.7	0.5	1.4	0.4
Plummer, ID	max	4.3	6.0	9.9	0.4	0.6	0.7
LaGrande, OR	max	3.4	4.4	8.0	0.4	0.5	0.8
Pinehurst, ID	max	3.0	6.5	12.5	0.2	0.5	0.5

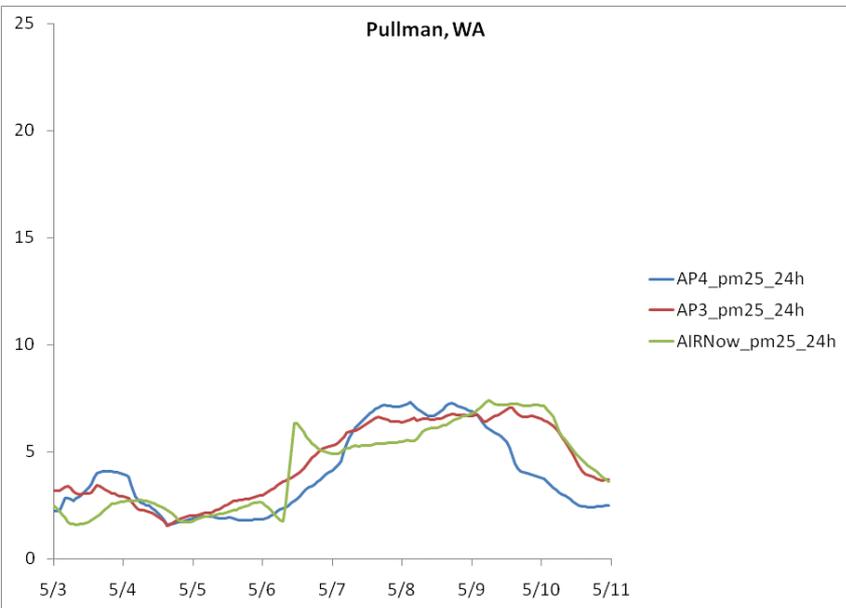
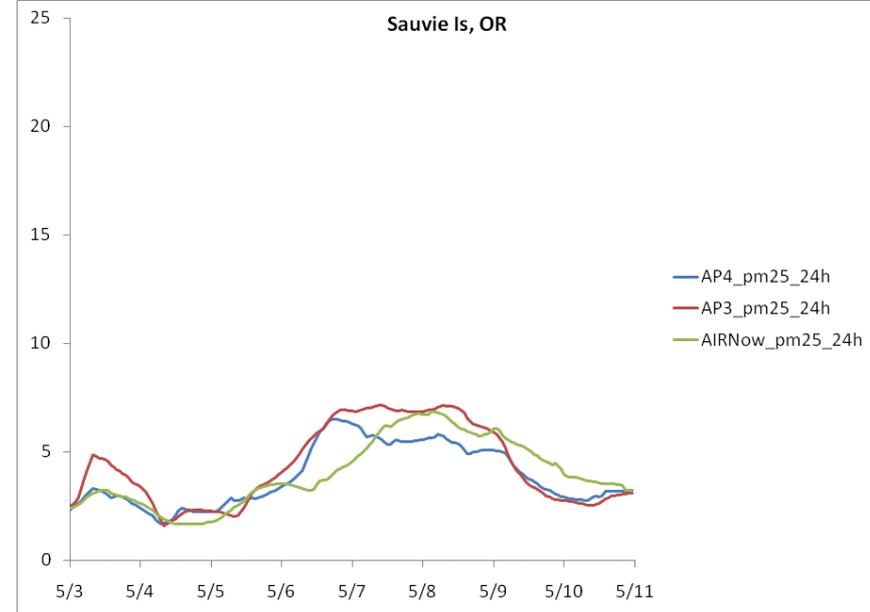
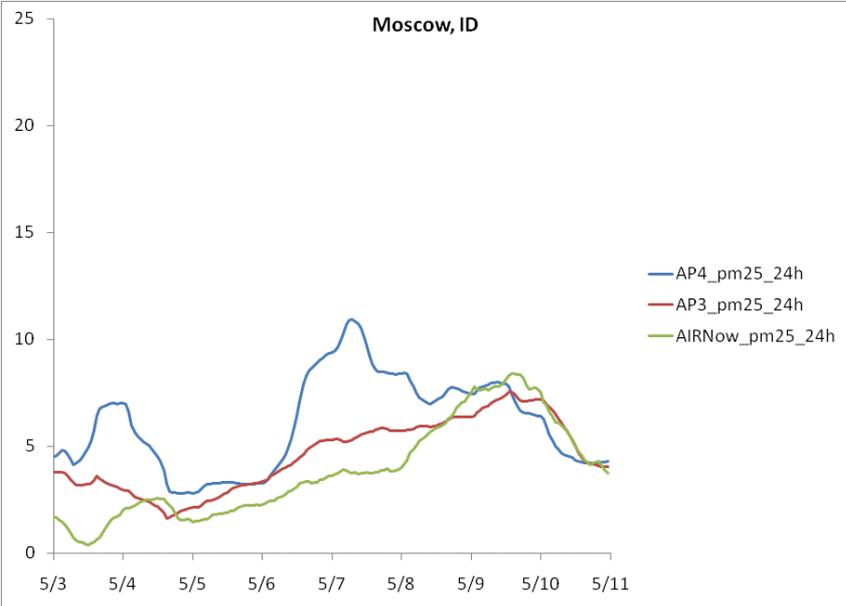


24 hr PM2.5 observed and predicted
Idaho Urban locations, May 3 - 10, 2012

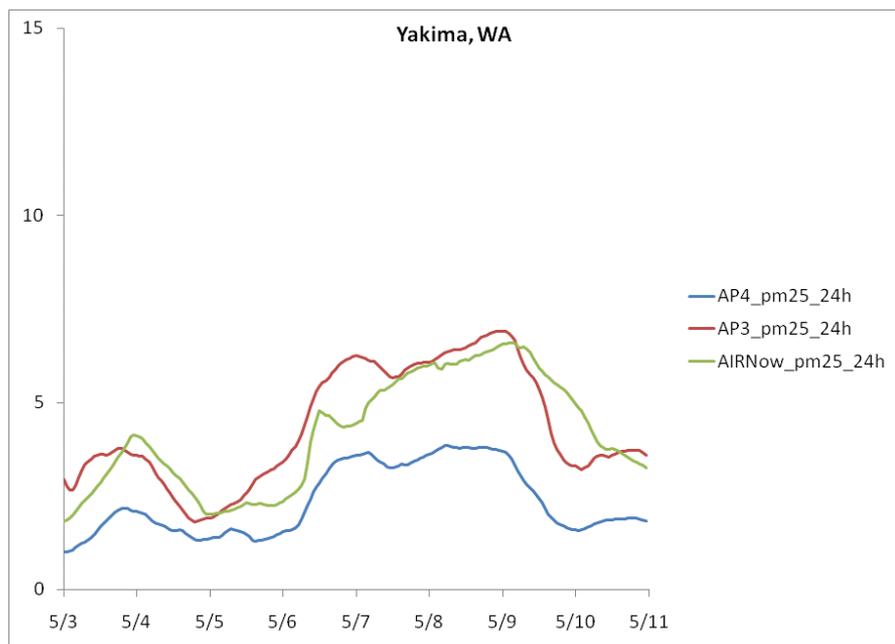
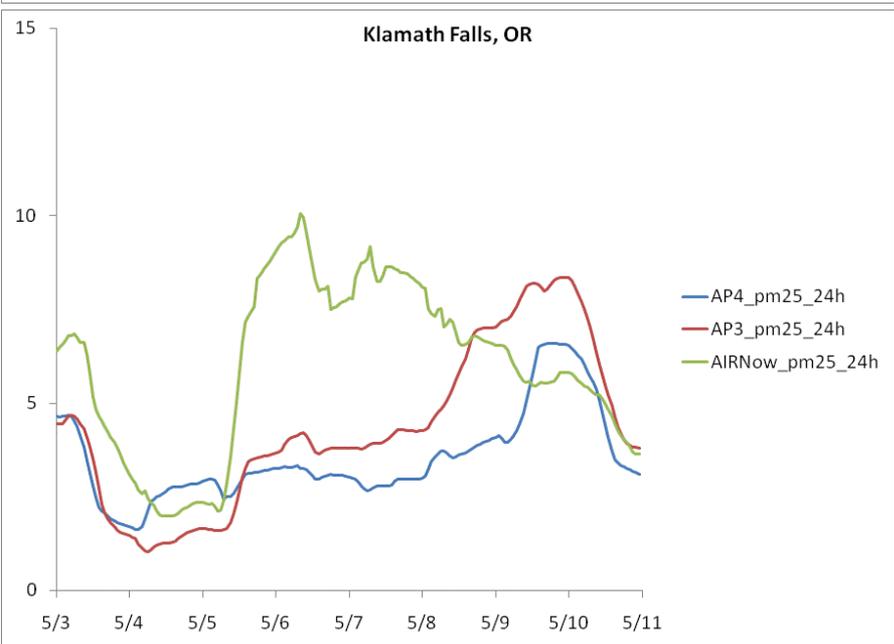
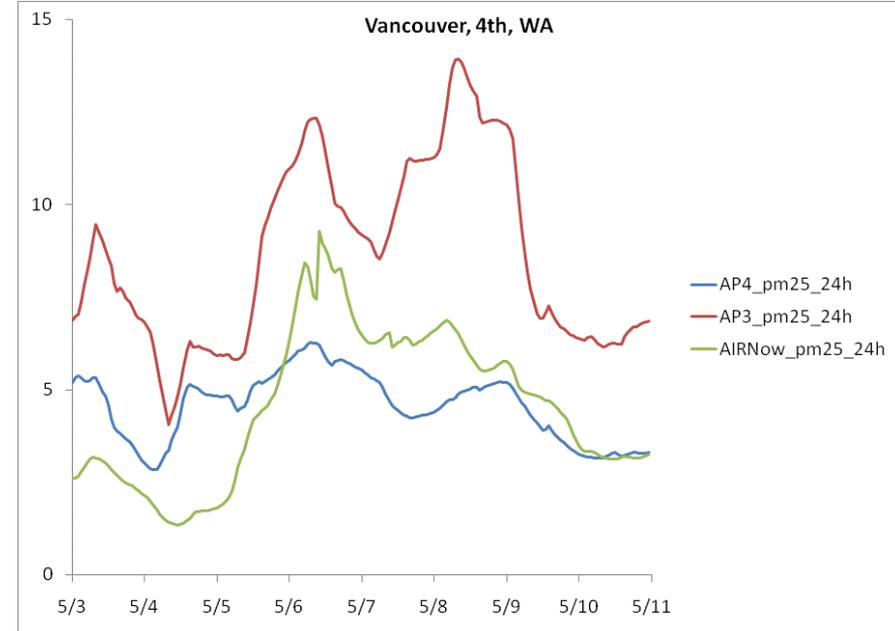
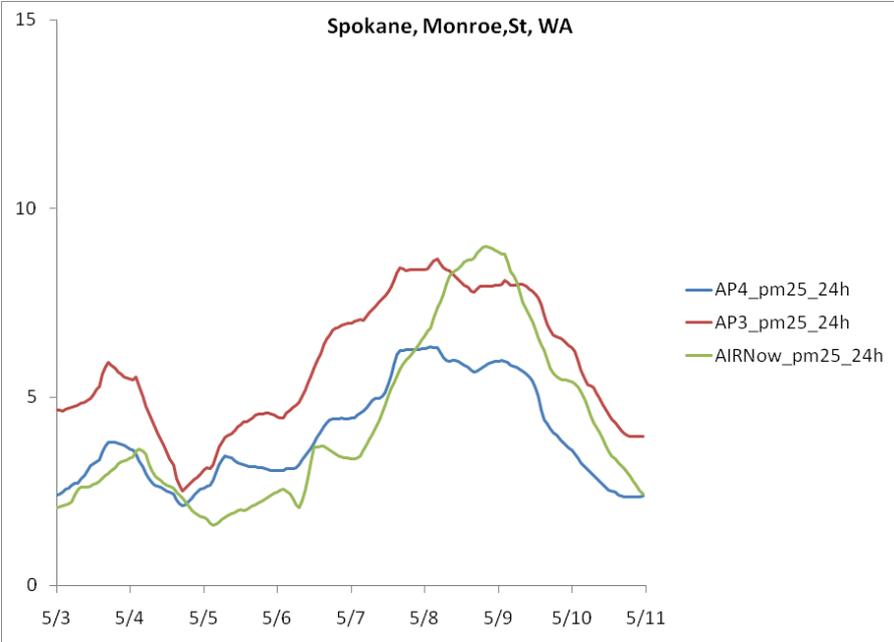
Observed concentrations less than 10 ug/m3,
AP3 and AP4 peak values from 10 to 45
ug/m3
obs << A3 and AP4



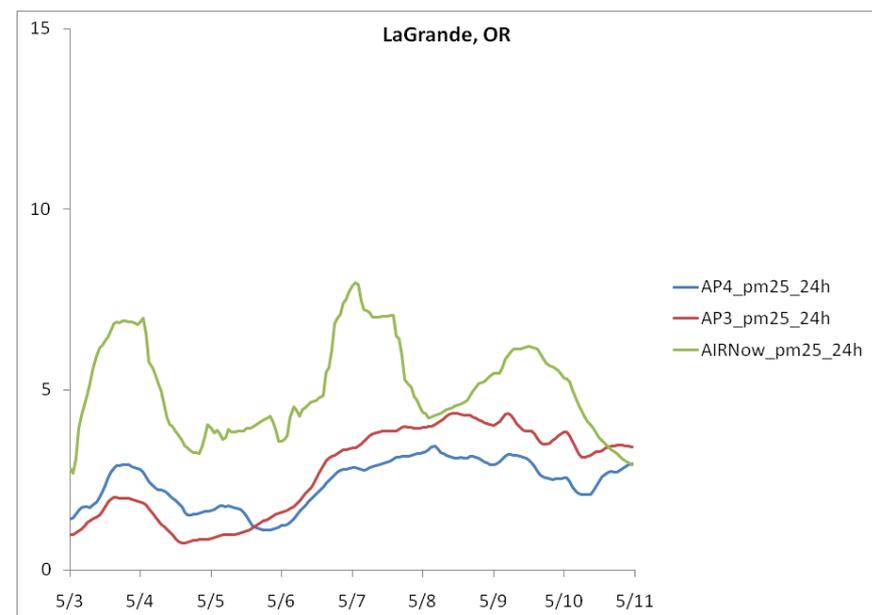
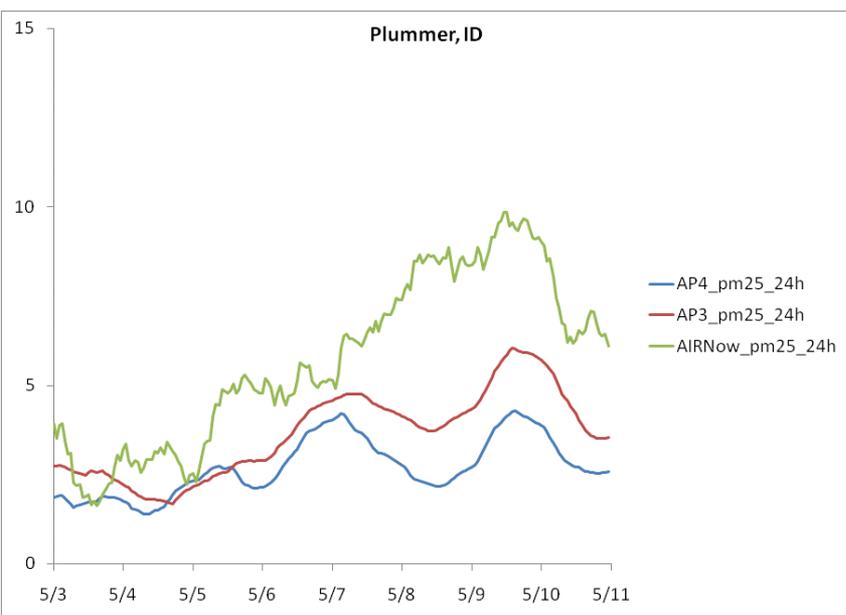
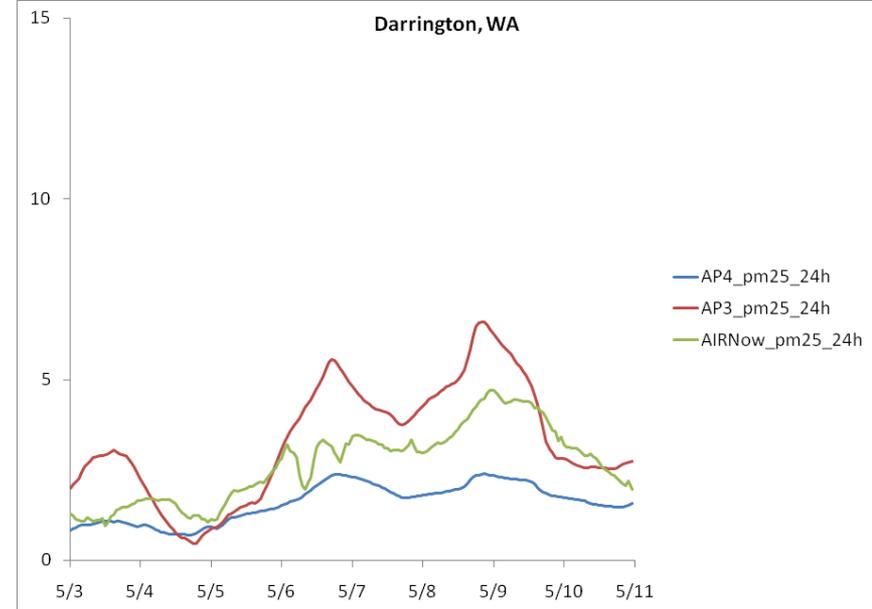
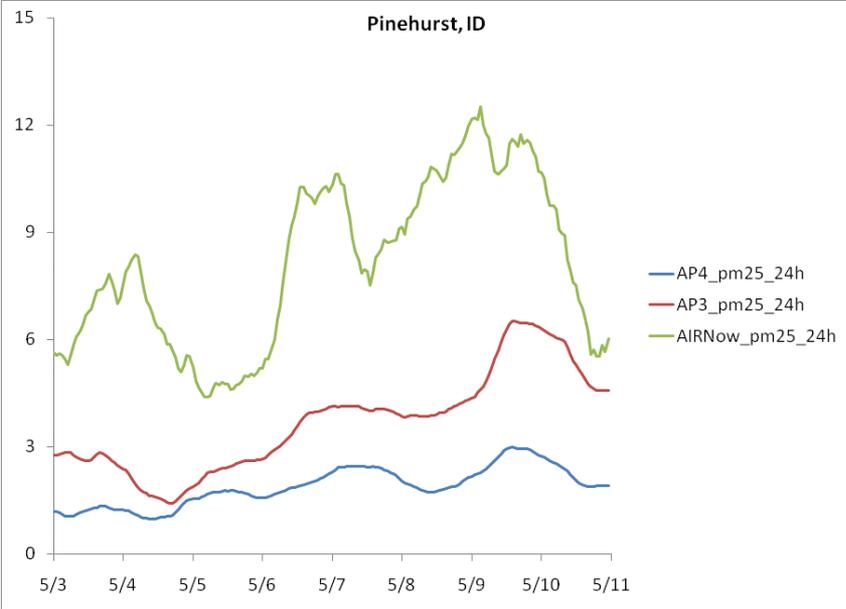
24 hr PM2.5 observed and predicted, Urban locations, May 3 - 10, 2012, AP3, AP4 and AIRNOW: observed concentrations less than 10 ug/m3, AP3 and AP4 peak values from 10 to 35 ug/m3, obs << A3 and AP4 , except in Medford



24 hr PM2.5 observed and predicted, suburban locations, May 3 - 10, 2012, AP3, AP4 and AIRNOW: observed and predicted concentrations less than 10 ug/m3
 obs similar to A3 and AP4



24 hr PM2.5 observed and predicted, suburban locations, May 3 - 10, 2012, AP3, AP4 and AIRNOW: obs less than 10 ug/m3, range of AP3 and AP4 behaviors



24 hr PM2.5 observed and predicted, Rural locations, May 3 - 10, 2012, AP3, AP4 and AIRNOW

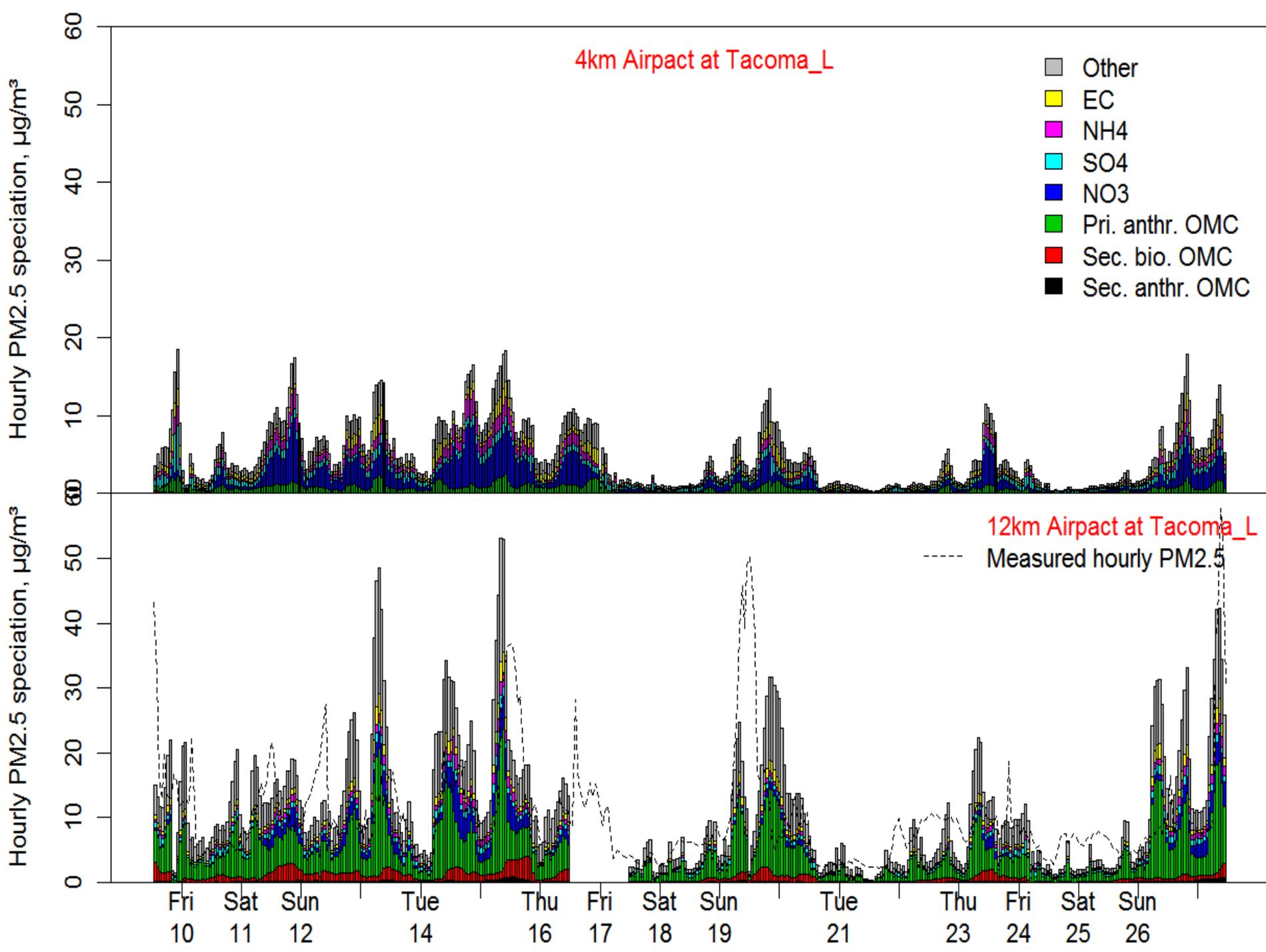
Low concentrations, AP3 > AP4, Obs > AP4

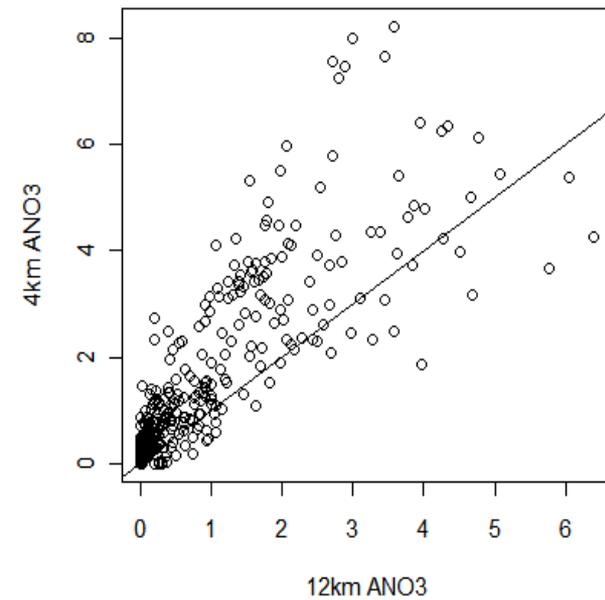
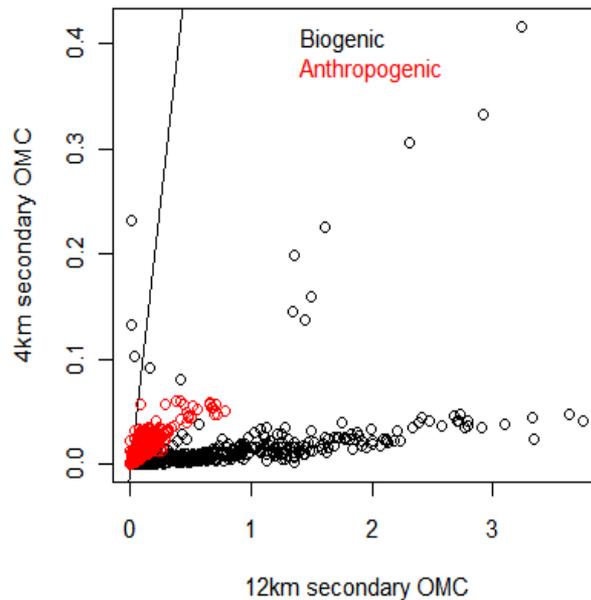
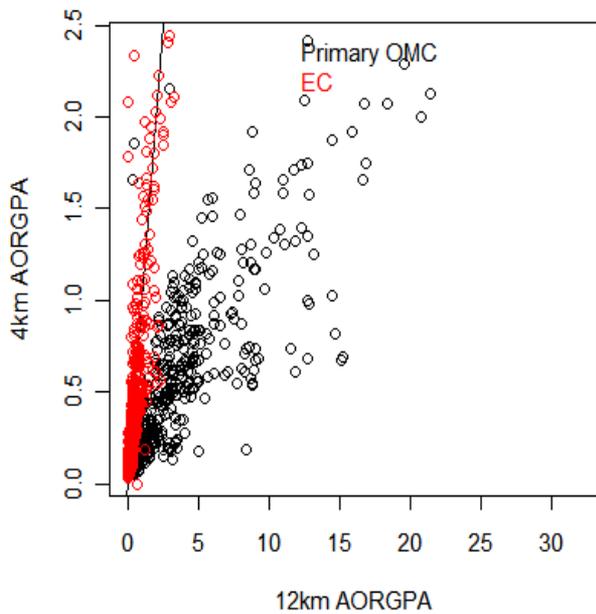
Summary

- Initial evaluation for PM_{2.5} mass during May, 2012 (not a woodstove period)
- Wide range of performance for PM_{2.5}
 - ID urban sites significant over-prediction
 - WA, OR urban to suburban sites moderately good performance
 - Rural sites somewhat underestimated
 - Patterns are similar for AP3 and AP4

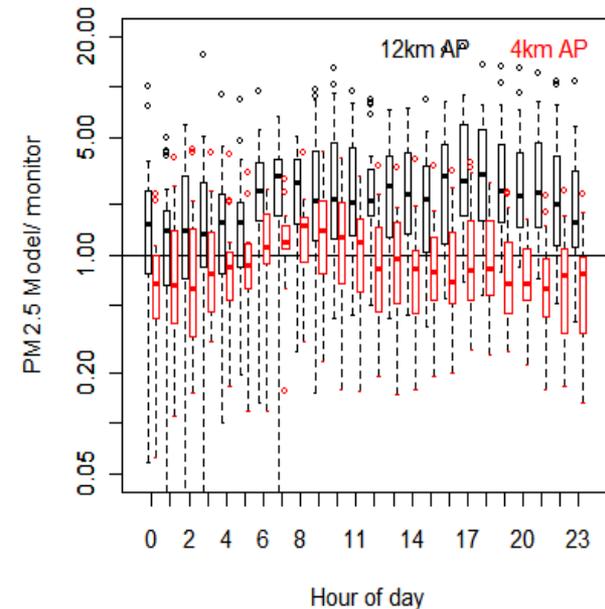
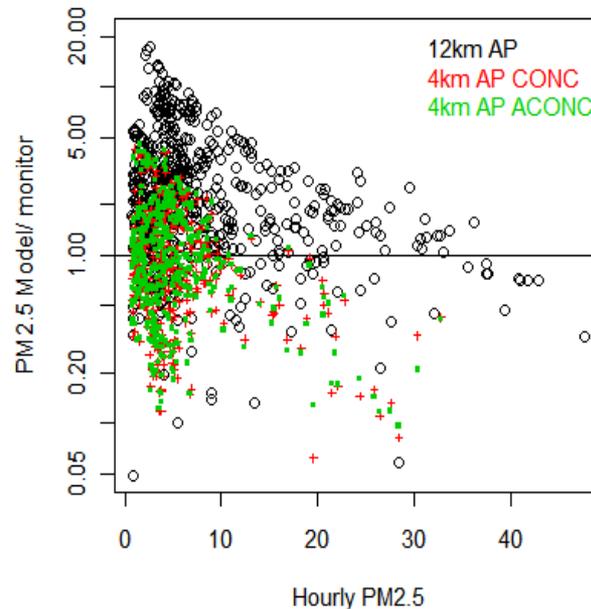
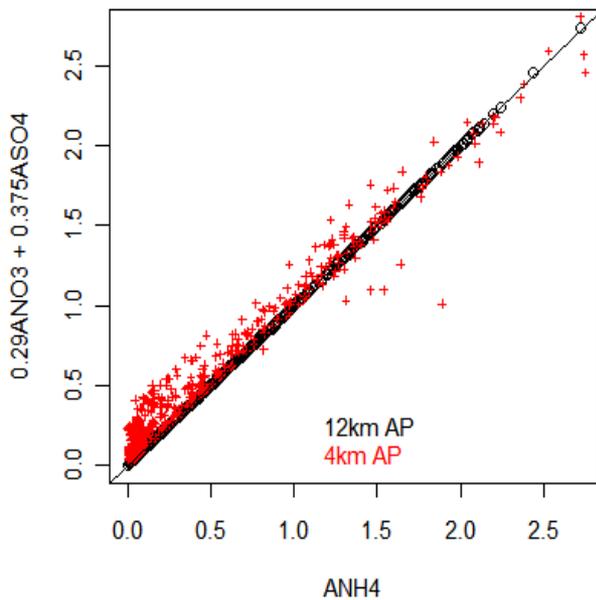
Some comparisons of AIRPACT-4 PM_{2.5} speciation

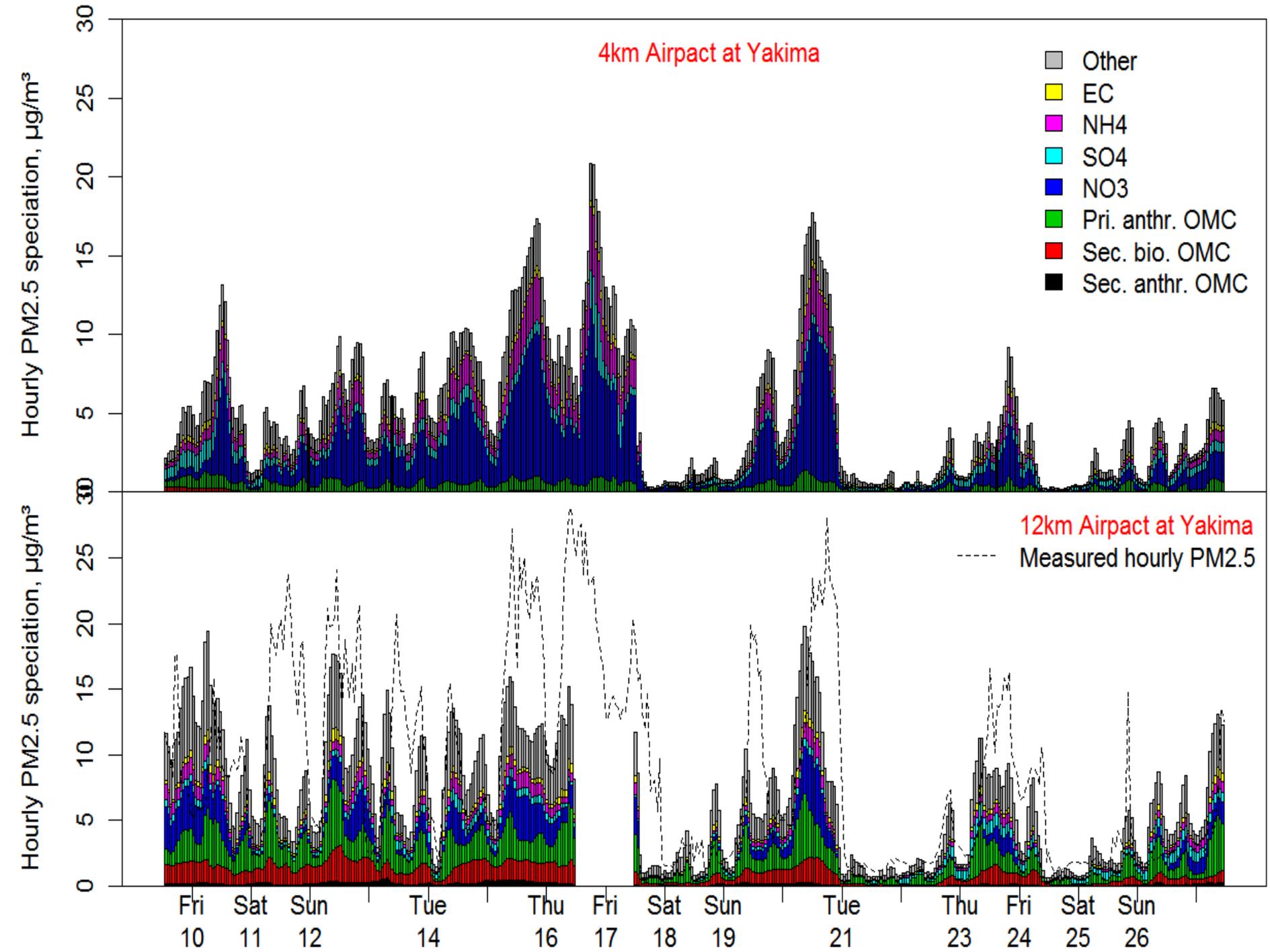
- Used data from AIRPACT-3 and AIRPACT-4 in February 2012
- Measured PM_{2.5} concentrations are not that low
- Measured speciation data not yet available
- Selected a few WA sites that sometimes have elevated PM_{2.5} levels
- Comparisons are based on hourly speciated model data





A species-by-species comparison of AP4 and AP3 at Tacoma is shown





Some conclusions from PM_{2.5} speciation work

- PM_{2.5} is underpredicted, even lower than the 12km.
- 4km produces more nitrate than the 12km
- Not all the nitrate and sulfate are completely neutralized by NH₄ in the 4km.
- The 4km has much less primary and secondary organics than the 12km.
- EC is similar in both models.
- AP4 not having a woodstove temperature adjustment is a possible explanation for the primary OMC being lower, which would also underestimate SOA