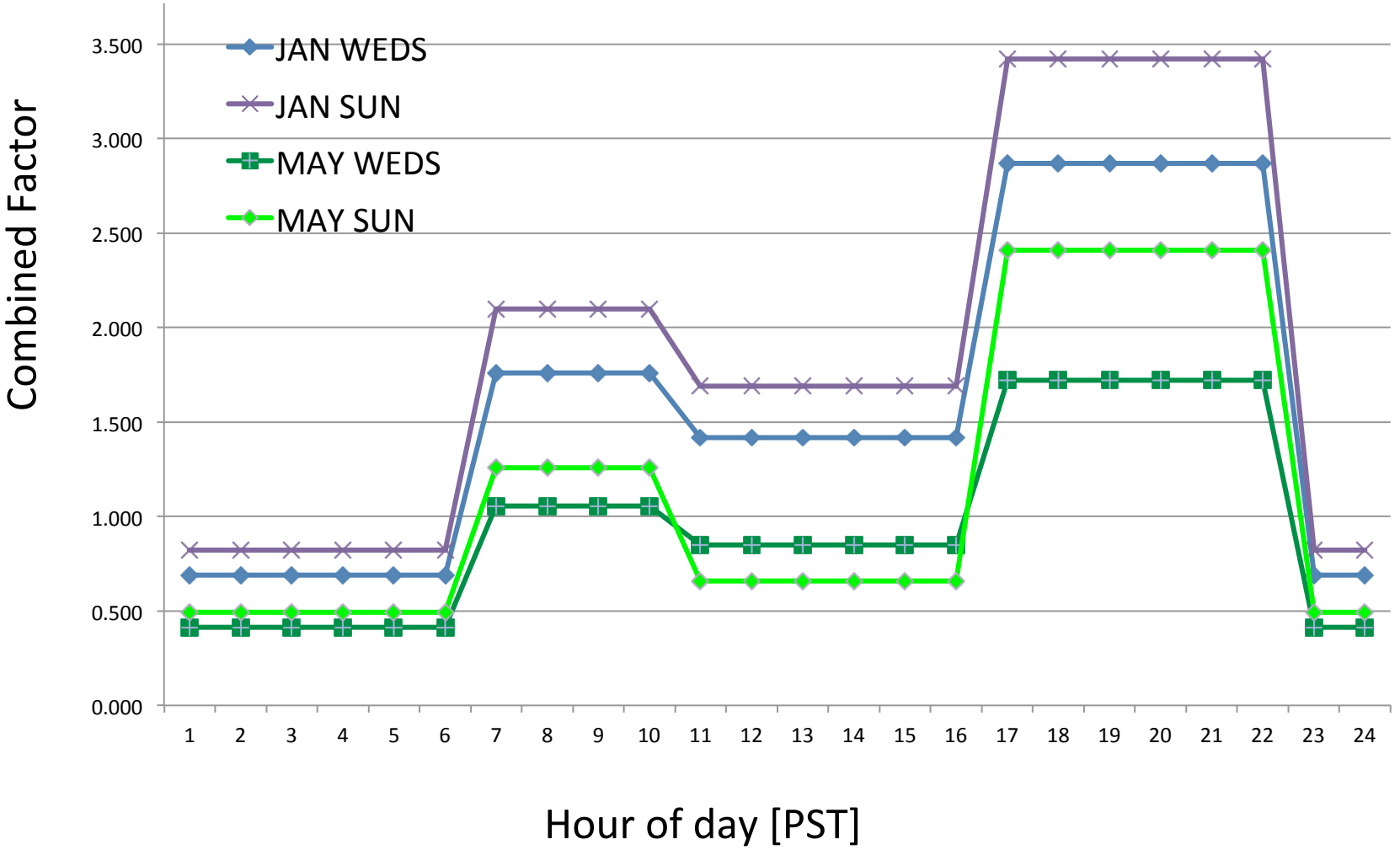
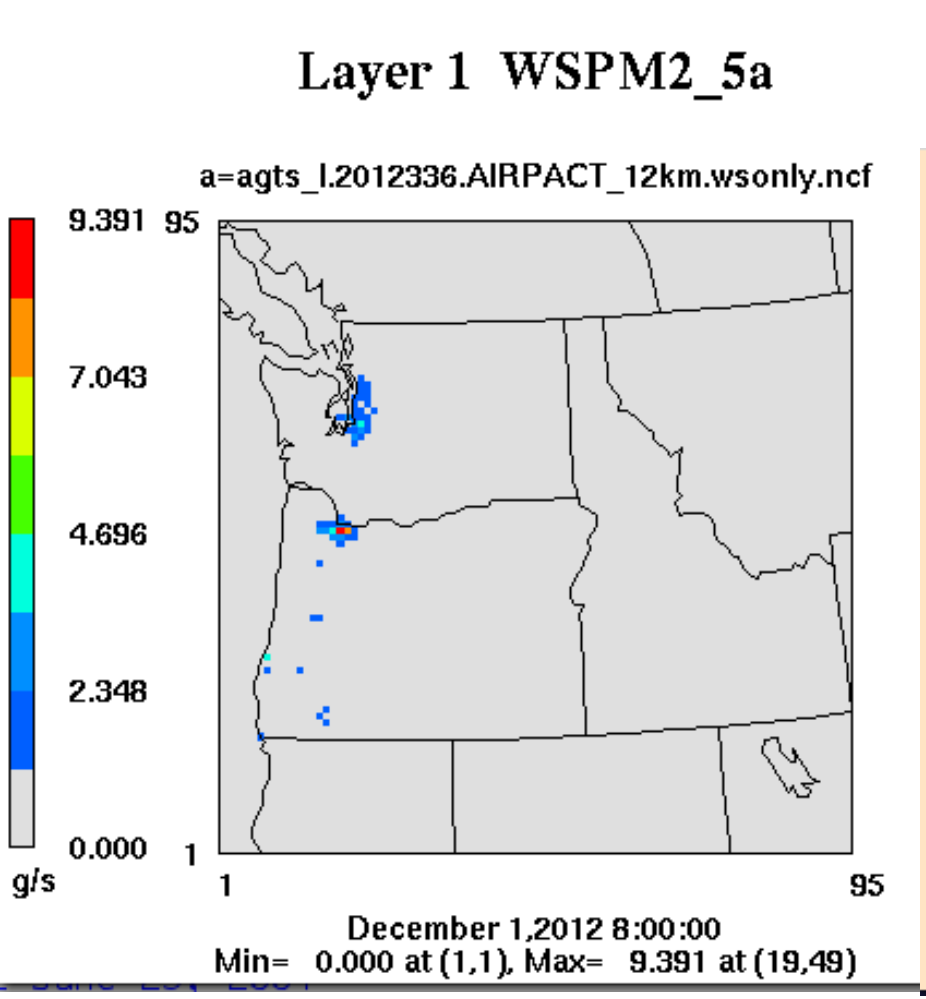
AIRPACT-3: Wood stove temp. adjustment v.3 of late February 2013 WSTA12 try # 2

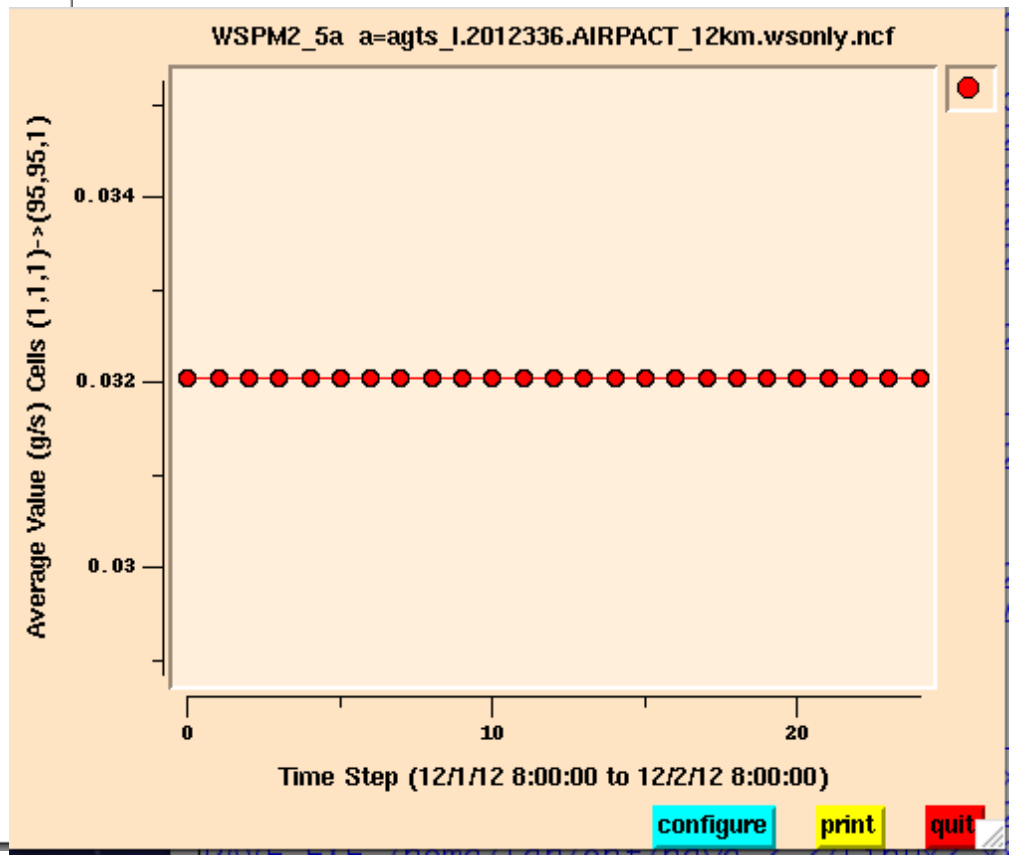
- Tons per heating- degree-day from Ecology (Sally Otterson)
- SMOKE SMKINVEN imports T/HDD as daily for tons per HD-Hour
- Application of normalized factors based on AIRPACT SMOKE temporal factors for Month, Day-of-Week and Hour-of-Day.
- Application of WRF-MCIP hourly TEMP2 to tons per HDH (20-50F)
- Merge WSTA12 with WSZero Area and all other sector emissions.
- Quick Look at Results for Dec 1-21, 2012
- Next?
-
-
-

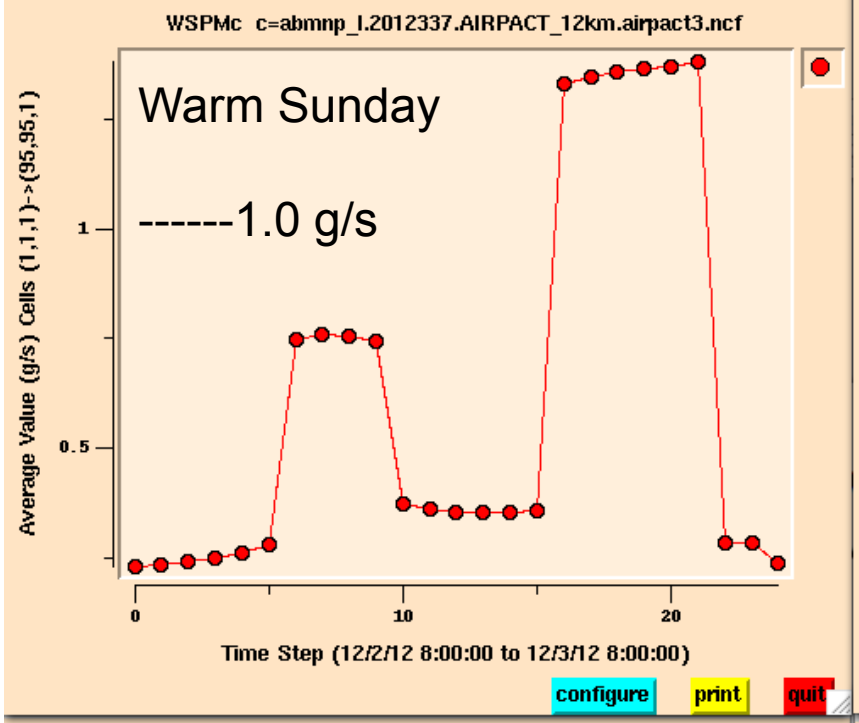
SMOKE Temporal factors for Month, Day & Hour, as combined, for four days, Wednesday and Sunday, winter and spring.

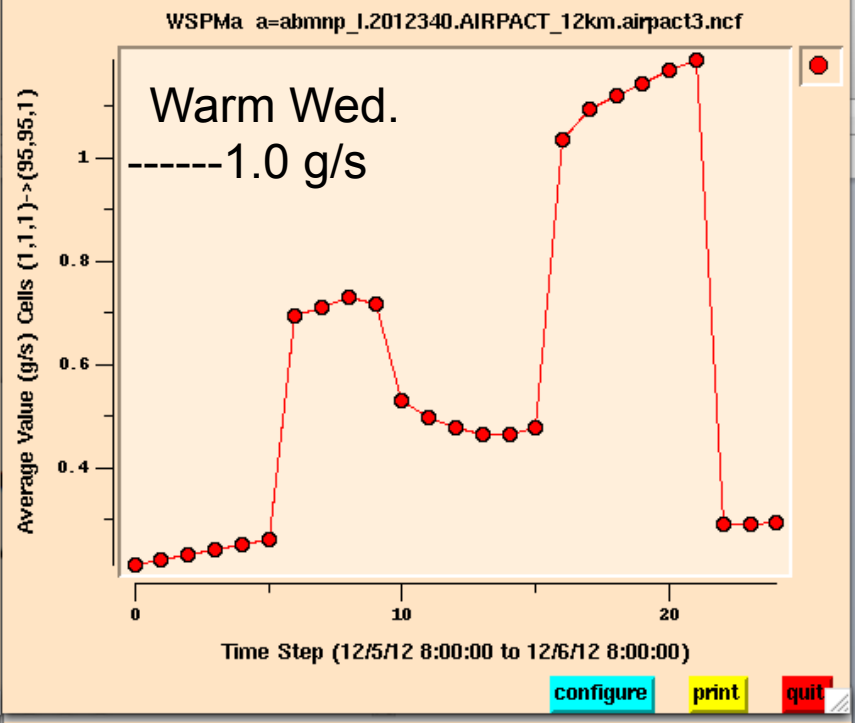


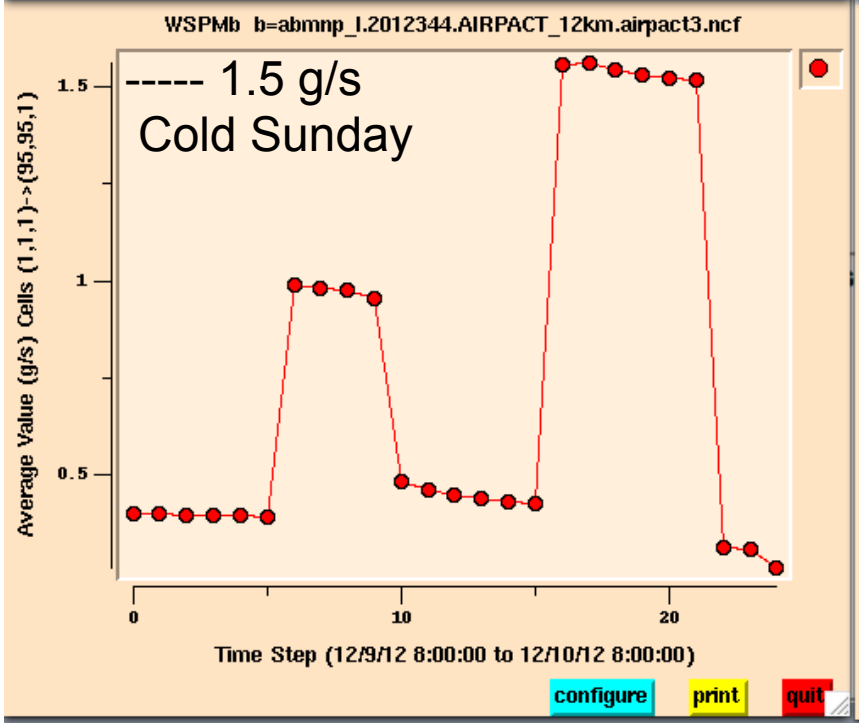
Woodstove PM emission as tons/HDDay of 0.032 g/s/HDHr, for Temporal and Temperature Adjustment. Map and domain average over hours.

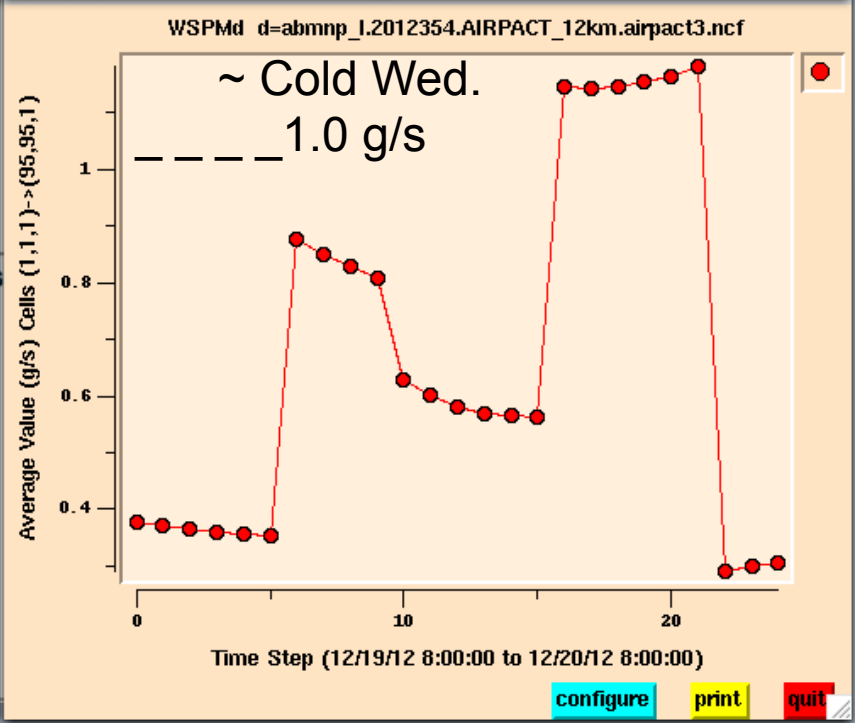




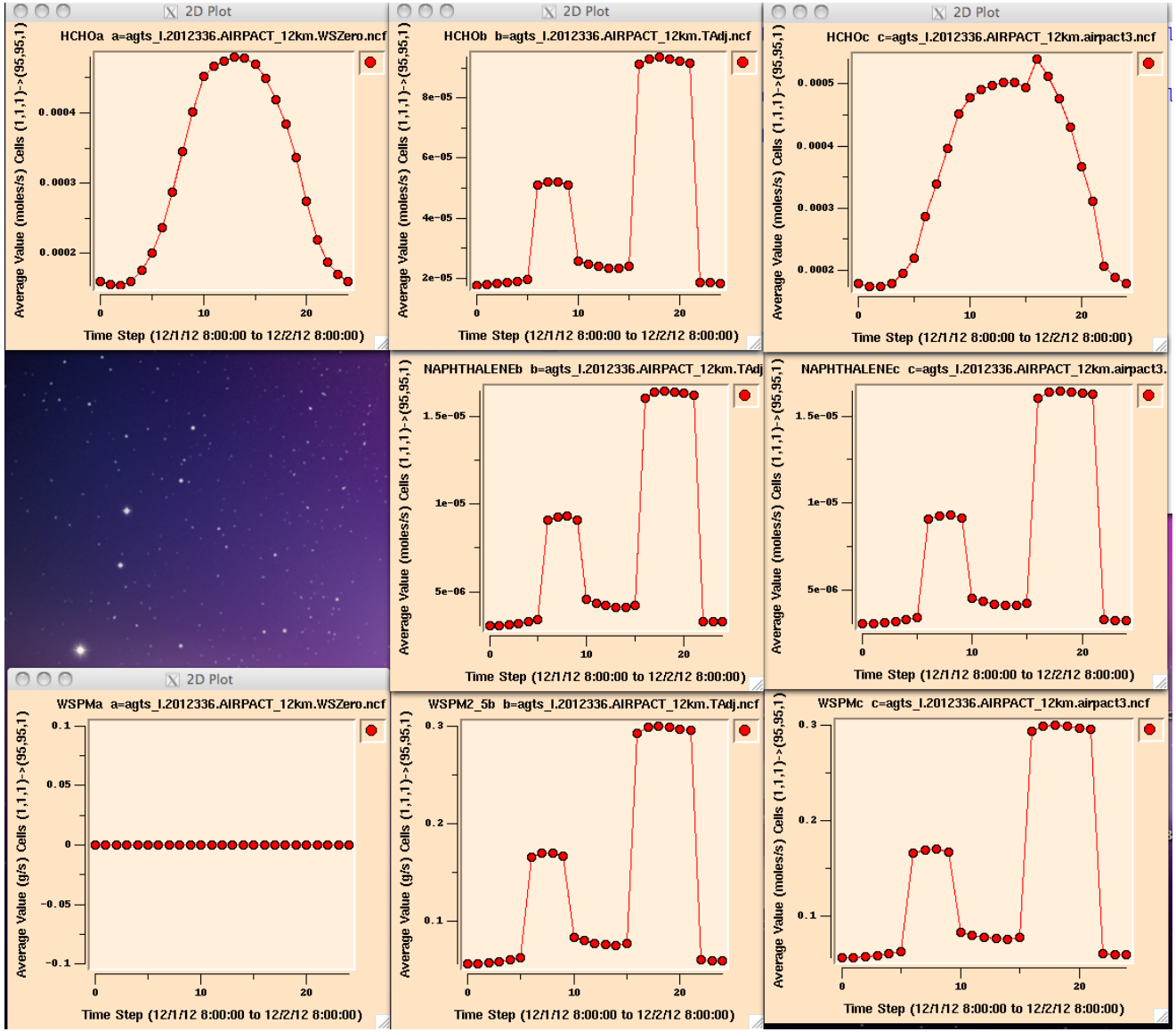

WSPMc c=abmnp_I.2012337.AIRPACT_12km.airpact3.ncf
Warm Sunday
------1.0 g/s
Average Value (g/s) Cells (1,1,1)->(95,95,1)
Time Step (12/2/12 8:00:00 to 12/3/12 8:00:00)
configure
print
quit


WSPMa a=abmnp_I.2012340.AIRPACT_12km.airpact3.ncf
Warm Wed.
------1.0 g/s
Average Value (g/s) Cells (1,1,1)->(95,95,1)
Time Step (12/5/12 8:00:00 to 12/6/12 8:00:00)
configure
print
quit


WSPMb b=abmnp_I.2012344.AIRPACT_12km.airpact3.ncf
----- 1.5 g/s
Cold Sunday
Average Value (g/s) Cells (1,1,1)->(95,95,1)
Time Step (12/9/12 8:00:00 to 12/10/12 8:00:00)
configure
print
quit

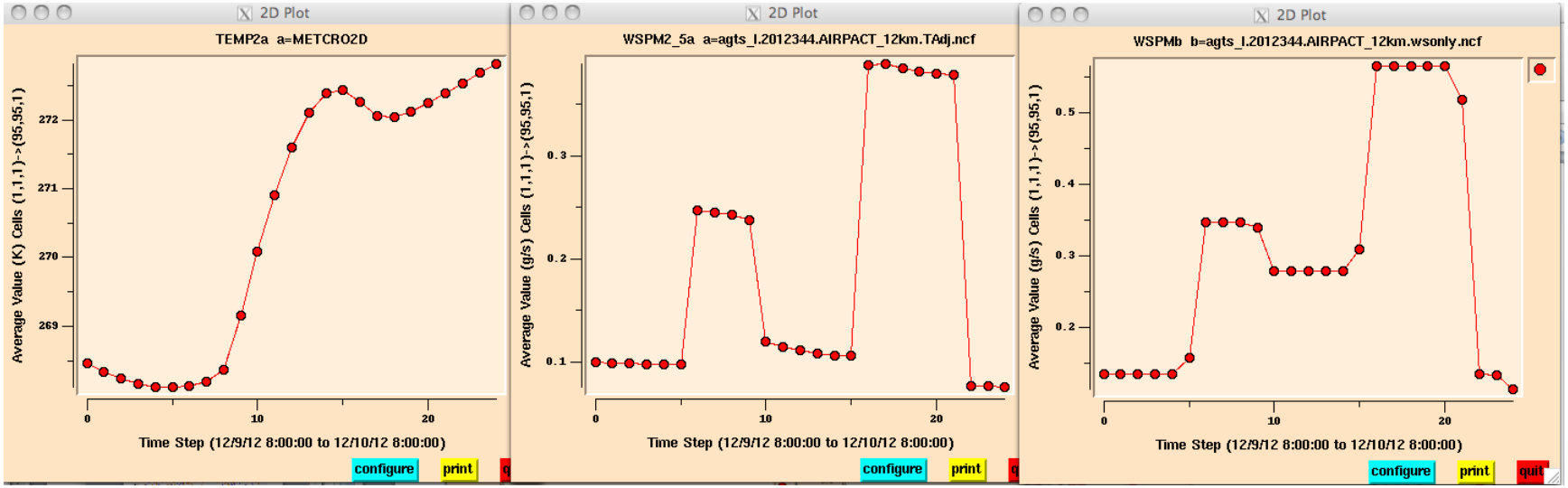

WSPMd d=abmnp_I.2012354.AIRPACT_12km.airpact3.ncf
~ Cold Wed.
_ _ _ _1.0 g/s
Average Value (g/s) Cells (1,1,1)->(95,95,1)
Time Step (12/19/12 8:00:00 to 12/20/12 8:00:00)
configure
print
quit

WSZero Plus WSTA12 for Merged Area Emissions



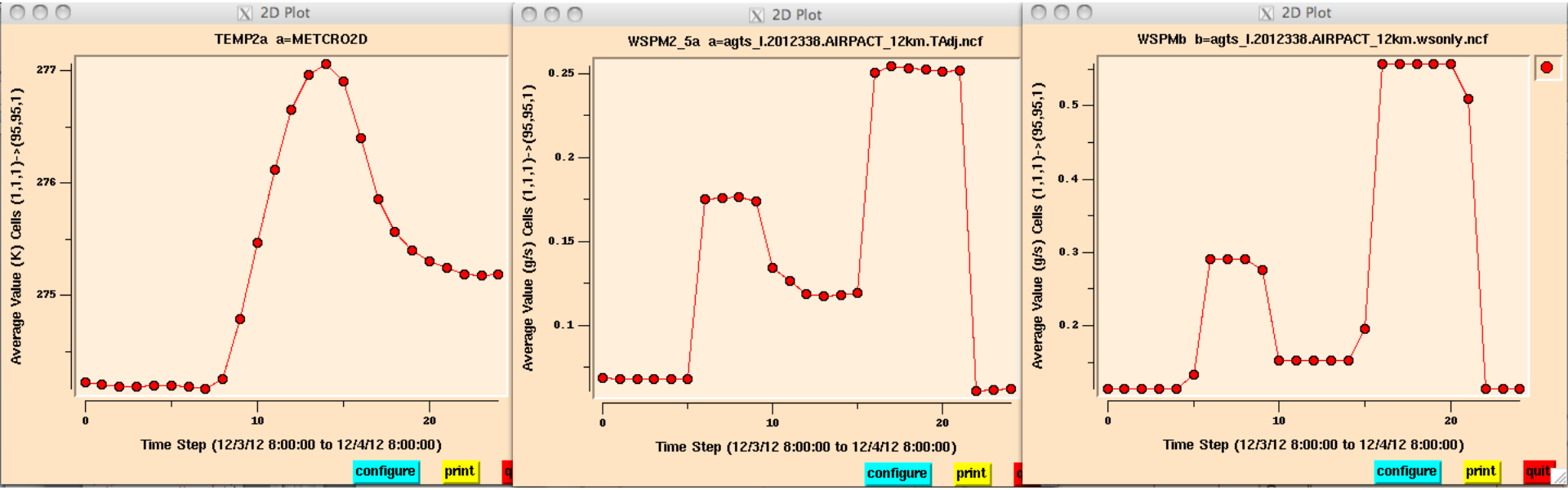
(old slide)

How does the (Tadj*FCTRs) WSPM compare to the Standard WSPM on a really cold day?



Domain-Avg TEMP2 is sub-freezing 12/9/12.
WSPM (t/HDHr) of 0.032 [g/s] was adjusted to reflect both Temperature and Temporal factors (Profiles) with a max of ~ 0.4 g/s compared to the Maximum in the Standard WSPM treatment of ~ 5.6 g/s.

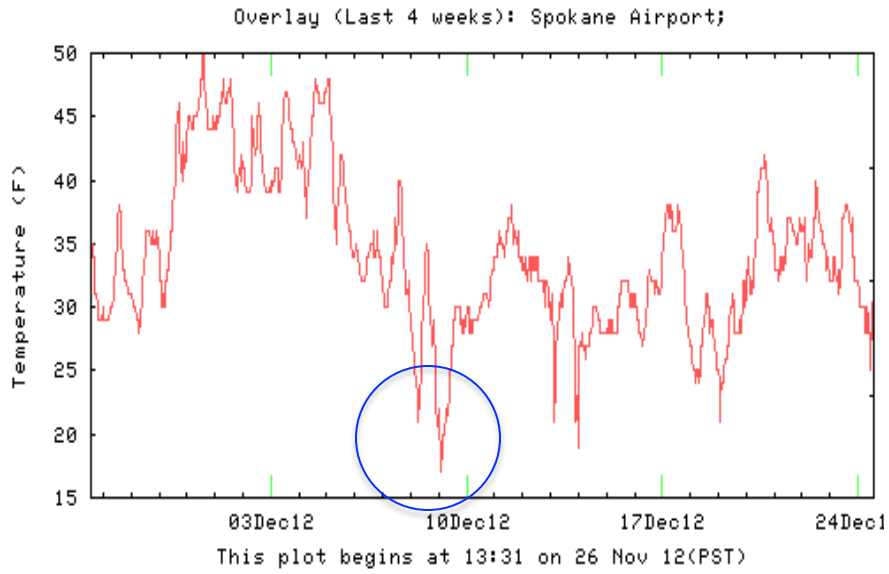
How does the (Tadj*FCTRs) WSPM compare to the Standard WSPM on a warm day?



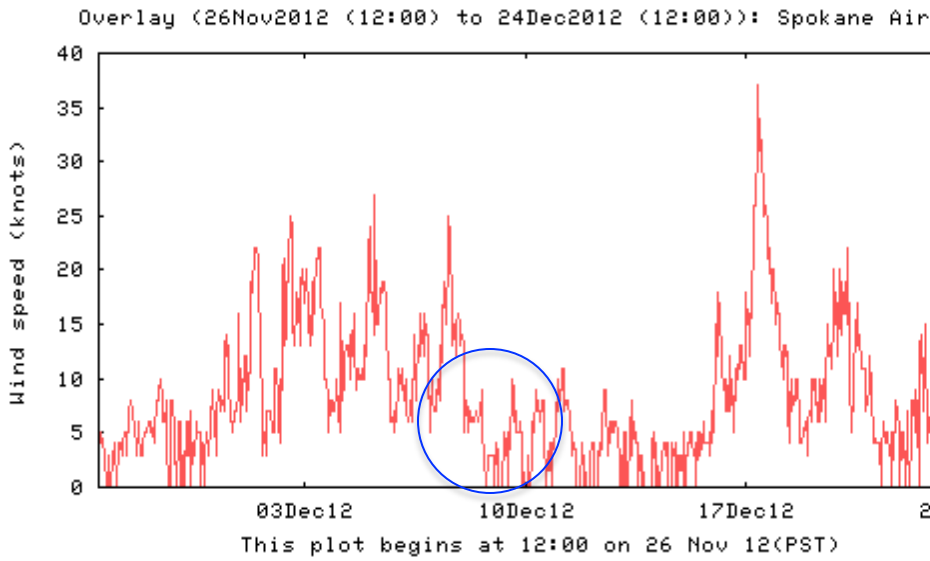
Domain-Avg TEMP2 is mostly above freezing 12/3/12.
WSPM (t/HDHr) of 0.032 [g/s] was adjusted to reflect both Temperature and Temporal factors (Profiles) with a max of ~ 0.26 g/s compared to the Maximum in the Standard WSPM treatment of (still)~ 5.6 g/s.

Spokane temps and wind ~Dec 19-20, 2012

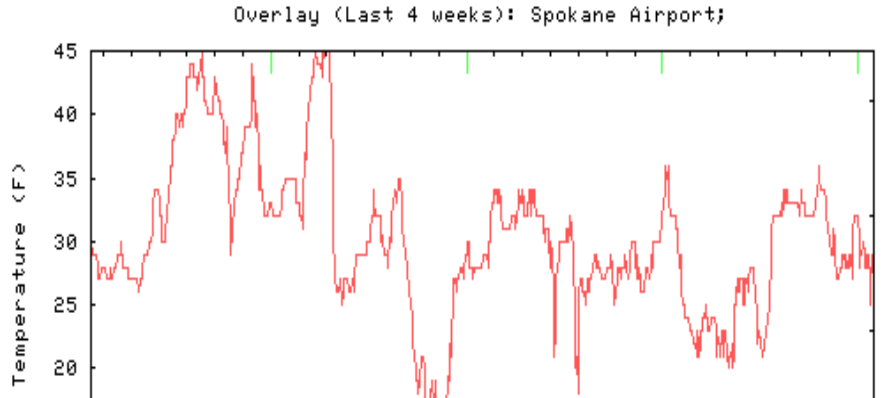
Air Temperature (Fahrenheit)



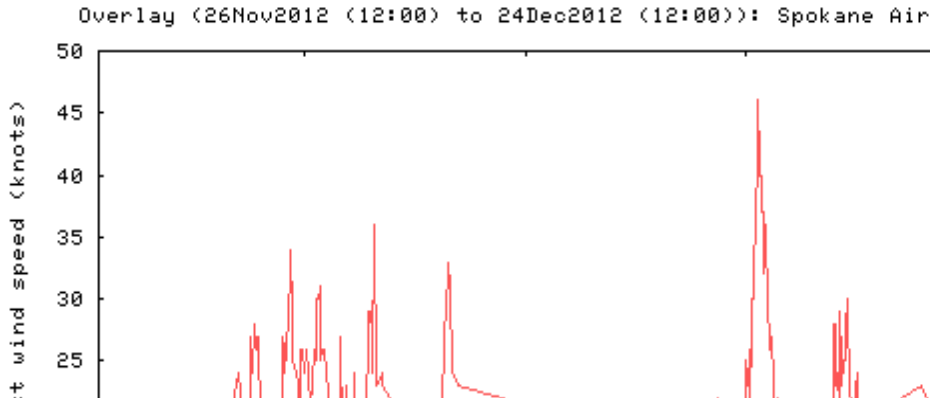
Wind speed (knots)

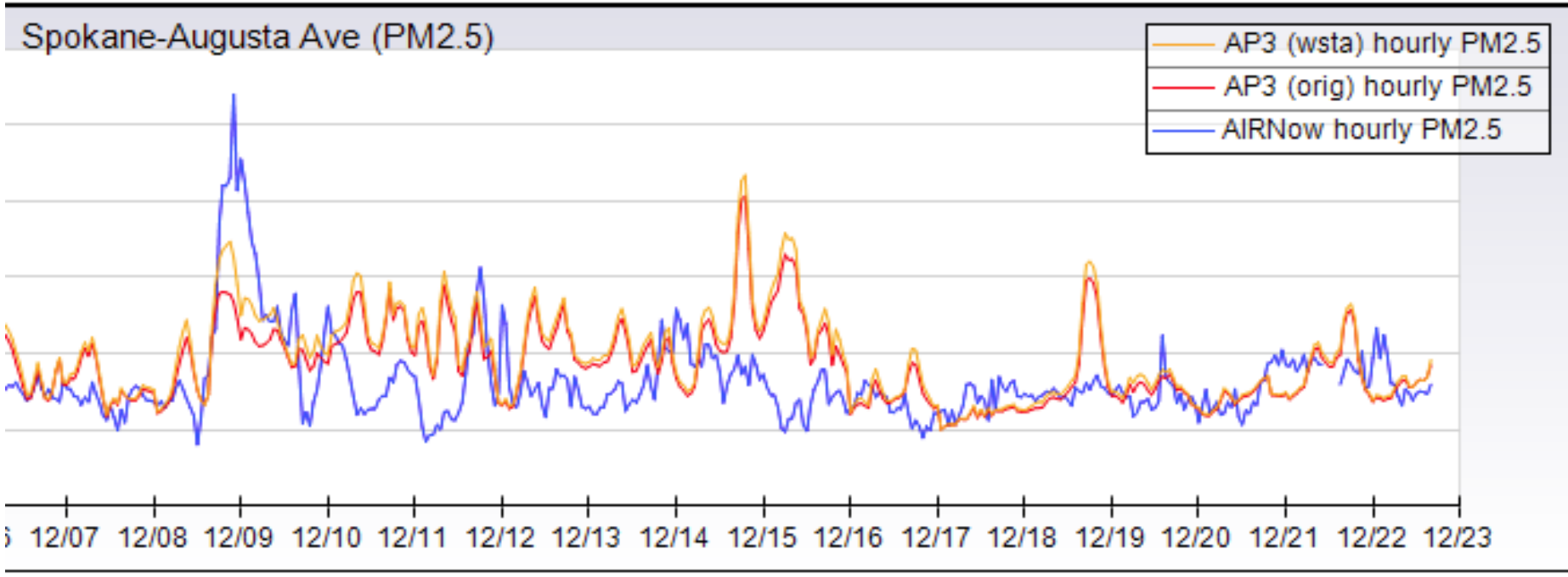


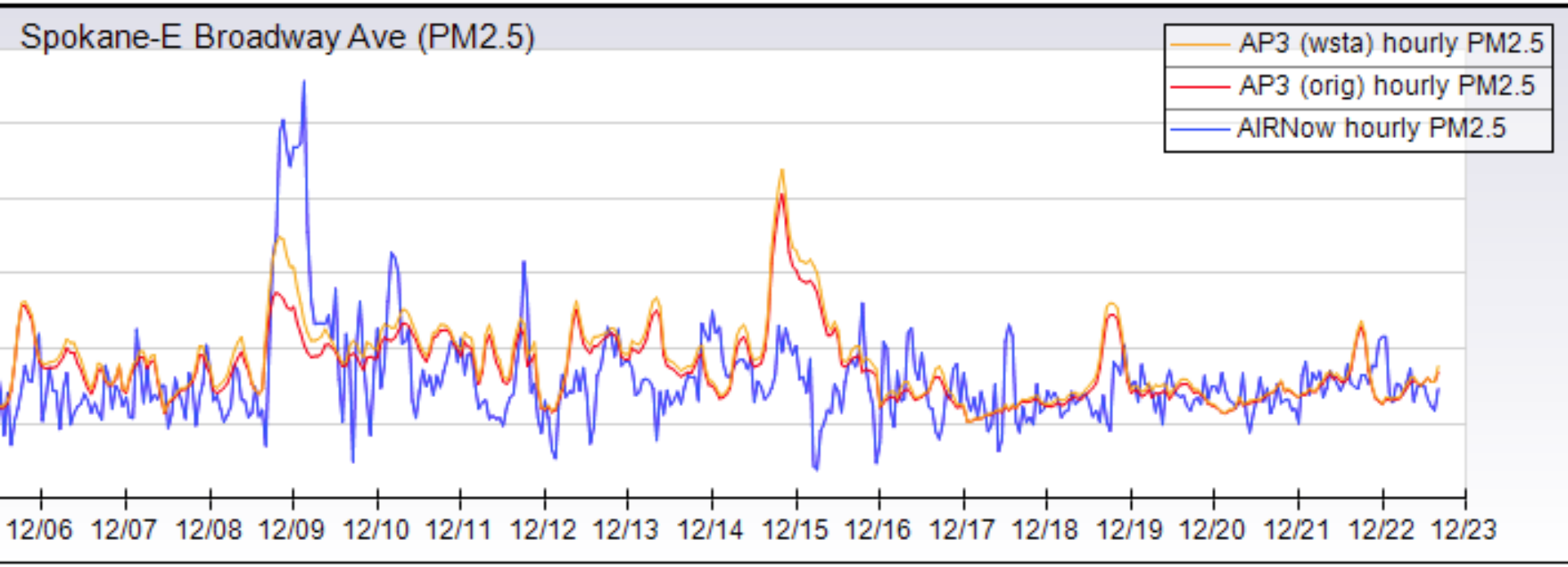
Dewpoint Temperature (Fahrenheit)

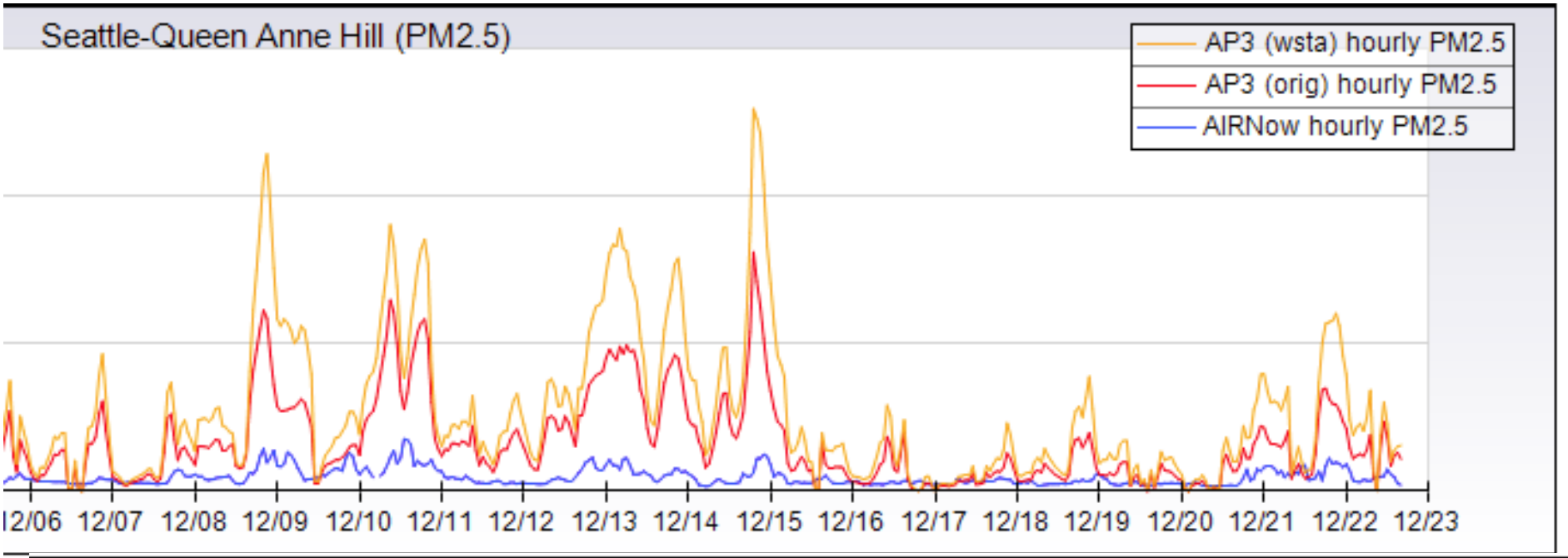


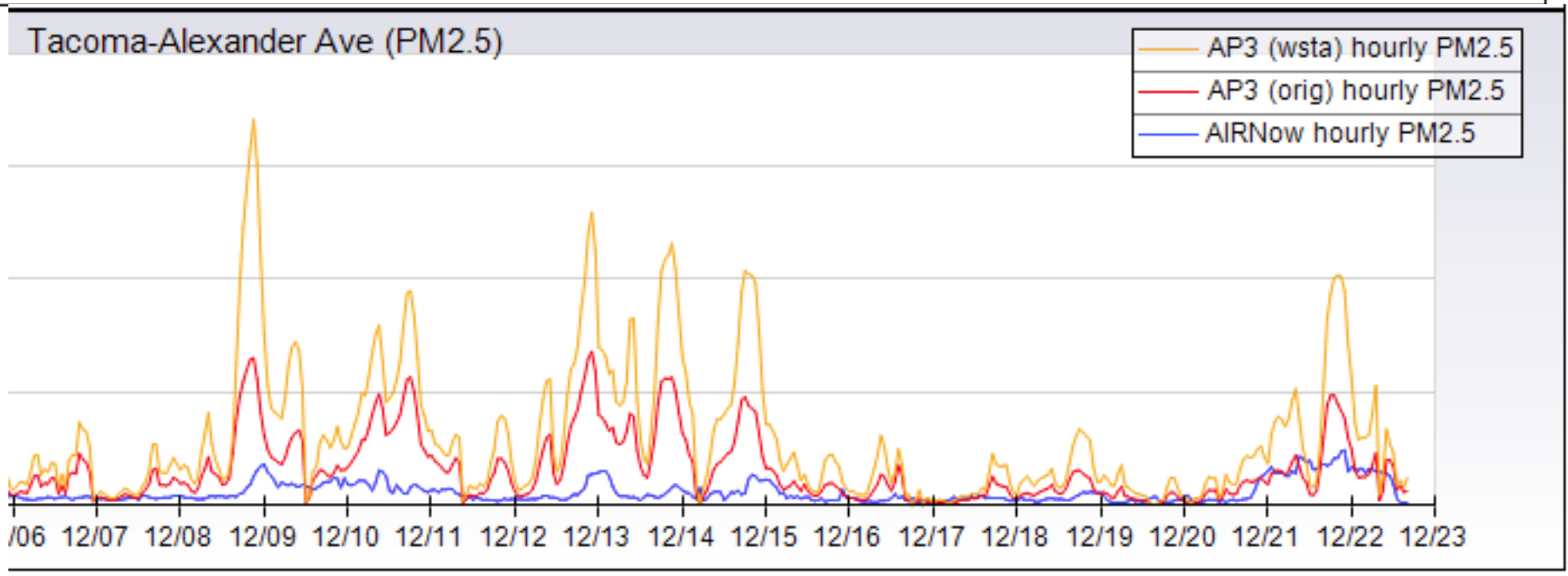
Gust wind speed (knots)

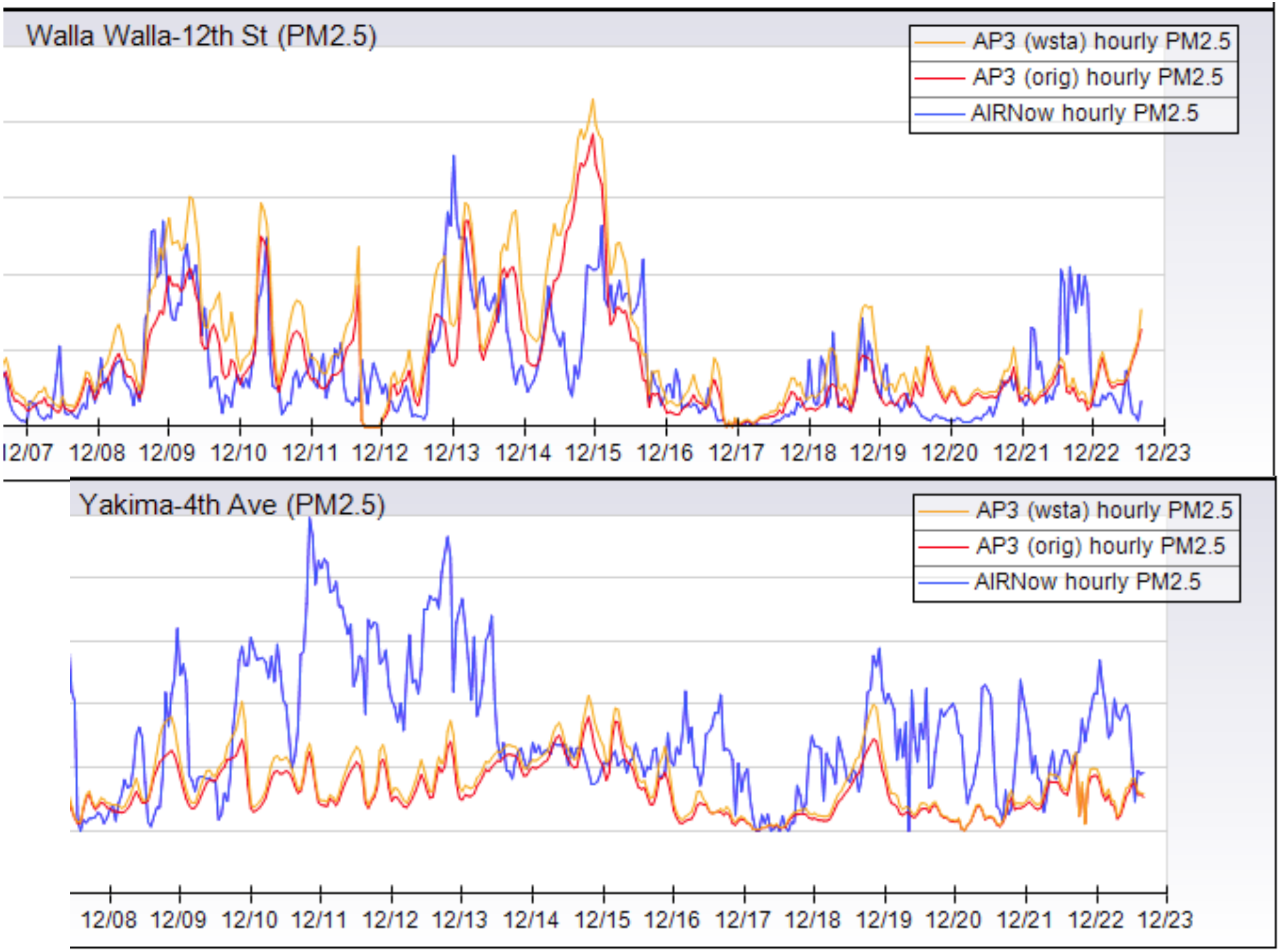


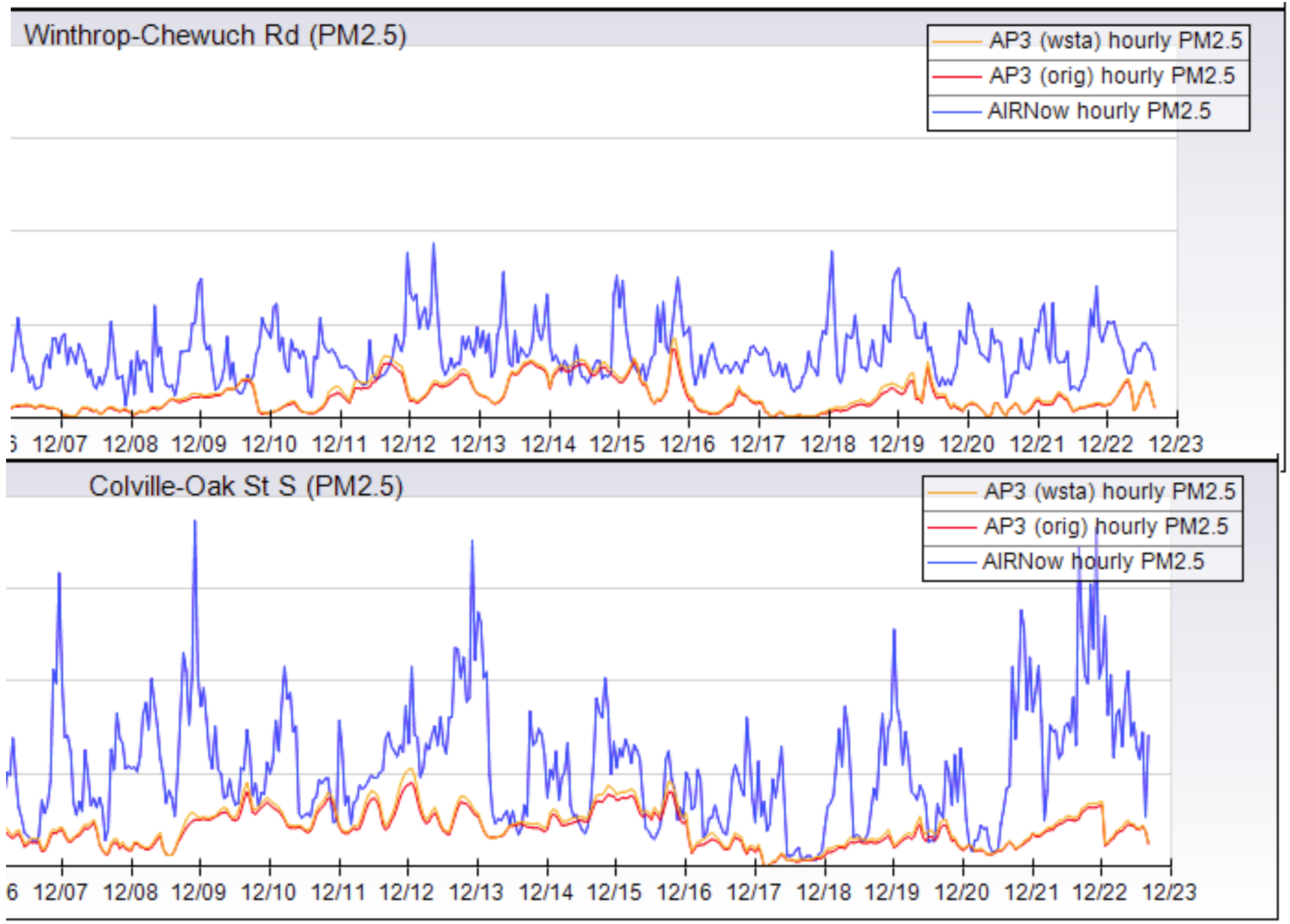

Spokane-Augusta Ave (PM2.5)
AP3 (wsta) hourly PM2.5
AP3 (orig) hourly PM2.5
AIRNow hourly PM2.5
12/07
12/08
12/09
12/10
12/11
12/12
12/13
12/14
12/15
12/16
12/17
12/18
12/19
12/20
12/21
12/22
12/23


Spokane-E Broadway Ave (PM2.5)
AP3 (wsta) hourly PM2.5
AP3 (orig) hourly PM2.5
AIRNow hourly PM2.5
12/06
12/07
12/08
12/09
12/10
12/11
12/12
12/13
12/14
12/15
12/16
12/17
12/18
12/19
12/20
12/21
12/22
12/23


Seattle-Queen Anne Hill (PM2.5)
AP3 (wsta) hourly PM2.5
AP3 (orig) hourly PM2.5
AIRNow hourly PM2.5
12/06 12/07 12/08 12/09 12/10 12/11 12/12 12/13 12/14 12/15 12/16 12/17 12/18 12/19 12/20 12/21 12/22 12/23


Tacoma-Alexander Ave (PM2.5)
AP3 (wsta) hourly PM2.5
AP3 (orig) hourly PM2.5
AIRNow hourly PM2.5
/06 12/07 12/08 12/09 12/10 12/11 12/12 12/13 12/14 12/15 12/16 12/17 12/18 12/19 12/20 12/21 12/22 12/23


Walla Walla-12th St (PM2.5)
AP3 (wsta) hourly PM2.5
AP3 (orig) hourly PM2.5
AIRNow hourly PM2.5
12/07 12/08 12/09 12/10 12/11 12/12 12/13 12/14 12/15 12/16 12/17 12/18 12/19 12/20 12/21 12/22 12/23
Yakima-4th Ave (PM2.5)
AP3 (wsta) hourly PM2.5
AP3 (orig) hourly PM2.5
AIRNow hourly PM2.5
12/08 12/09 12/10 12/11 12/12 12/13 12/14 12/15 12/16 12/17 12/18 12/19 12/20 12/21 12/22 12/23


Winthrop-Chewuch Rd (PM2.5)
AP3 (wsta) hourly PM2.5
AP3 (orig) hourly PM2.5
AIRNow hourly PM2.5
12/07 12/08 12/09 12/10 12/11 12/12 12/13 12/14 12/15 12/16 12/17 12/18 12/19 12/20 12/21 12/22 12/23
Colville-Oak St S (PM2.5)
AP3 (wsta) hourly PM2.5
AP3 (orig) hourly PM2.5
AIRNow hourly PM2.5
6 12/07 12/08 12/09 12/10 12/11 12/12 12/13 12/14 12/15 12/16 12/17 12/18 12/19 12/20 12/21 12/22 12/23

Next…

- Further analysis…
- Implement for testing in AIRPACT-4 to address uncertainties of the effect of grid cell size mismatch to monitor volume for small towns with high density of woodstoves.
- Construction of an spatial error function based on periods of low winds and by temperature?