

Air Toxic Community Assessment Studies in Spokane Washington

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SPOKANE OBJECTIVES

1. Characterize community ambient air toxics concentrations and their spatial and seasonal patterns.
2. Determine base-line air toxics concentrations.
3. Estimate source apportionment for the study area.
4. Compare NATA and AIRPACT air toxics modeling results with measured data in Spokane.
5. Evaluate health risks to the community from exposure to air toxics.

SPOKANE FIXED SITE MEASUREMENTS

- VOCs (EPA “CORE SPECIES” PLUS OTHERS)
- CARBONYLS
- METALS IN PM₁₀

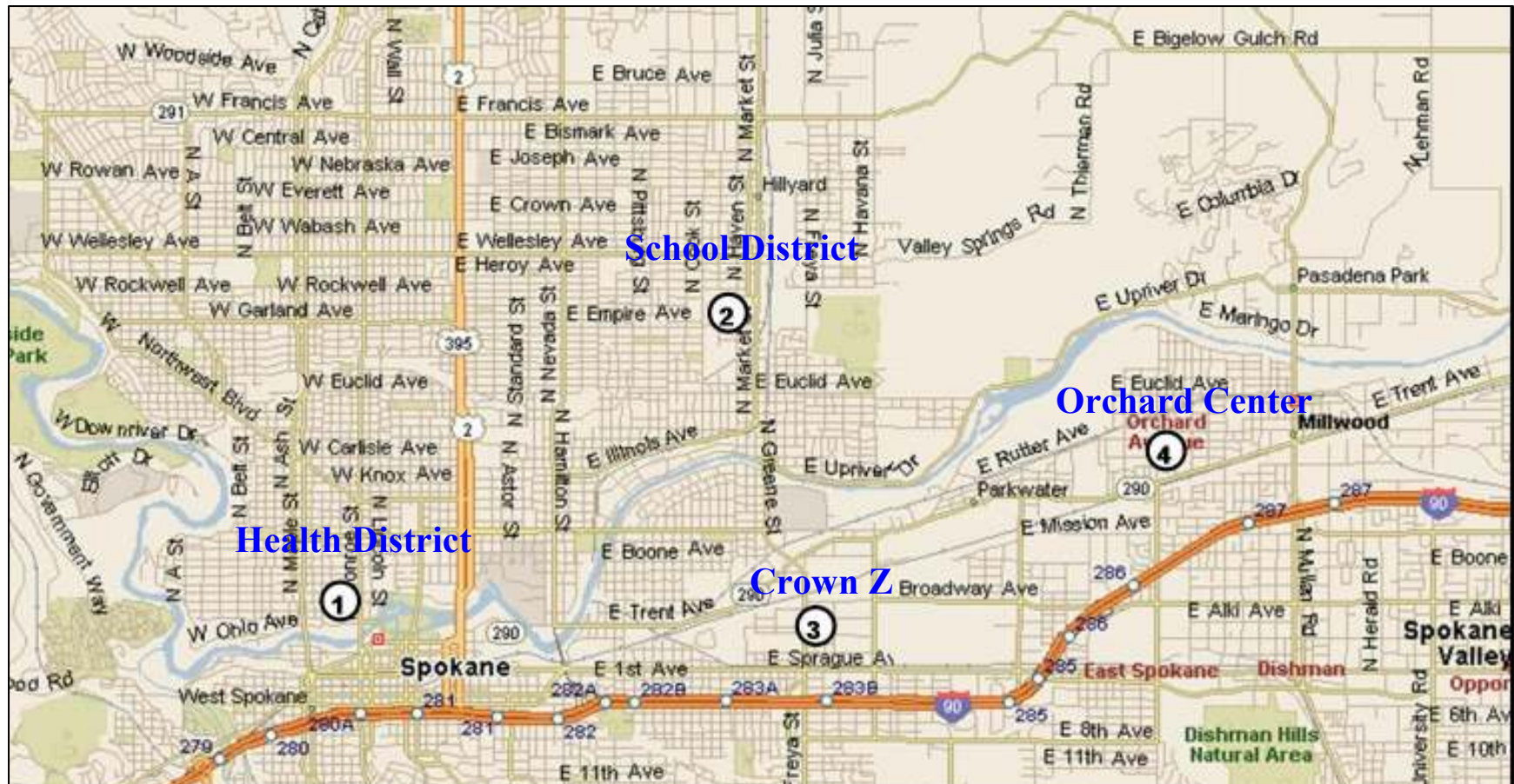
ANALYTICAL PROCEDURES

- TO-15 GC – FID & ECD
- TO-11A DNPH CARTRIDGE & HPLC
- IO-3.5 QUARTZ FILTER & ICPMS

NORTHWEST MAP

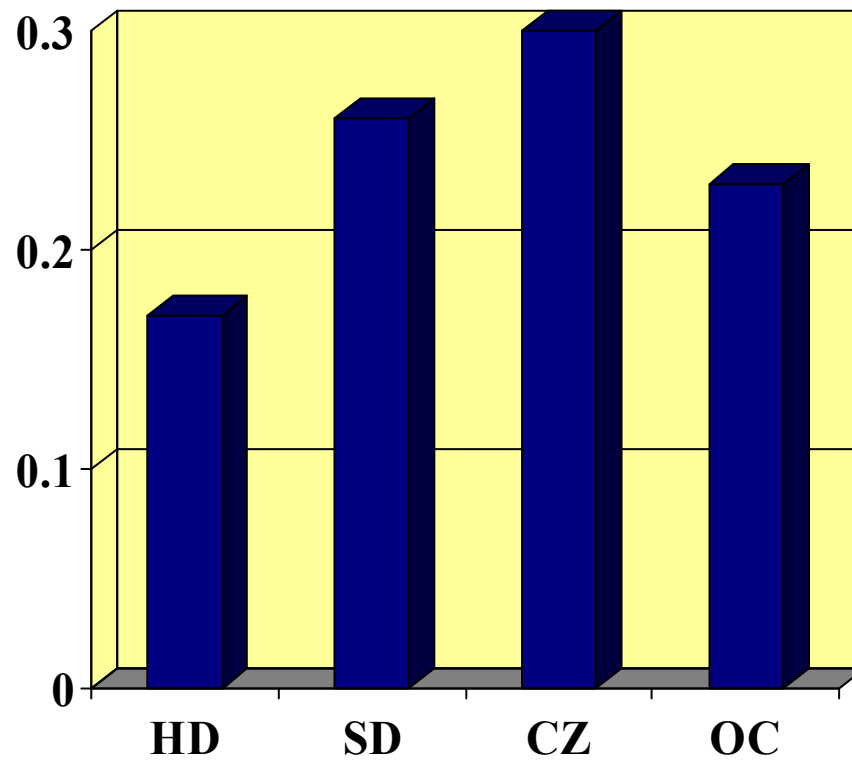


SPOKANE SITE MAP



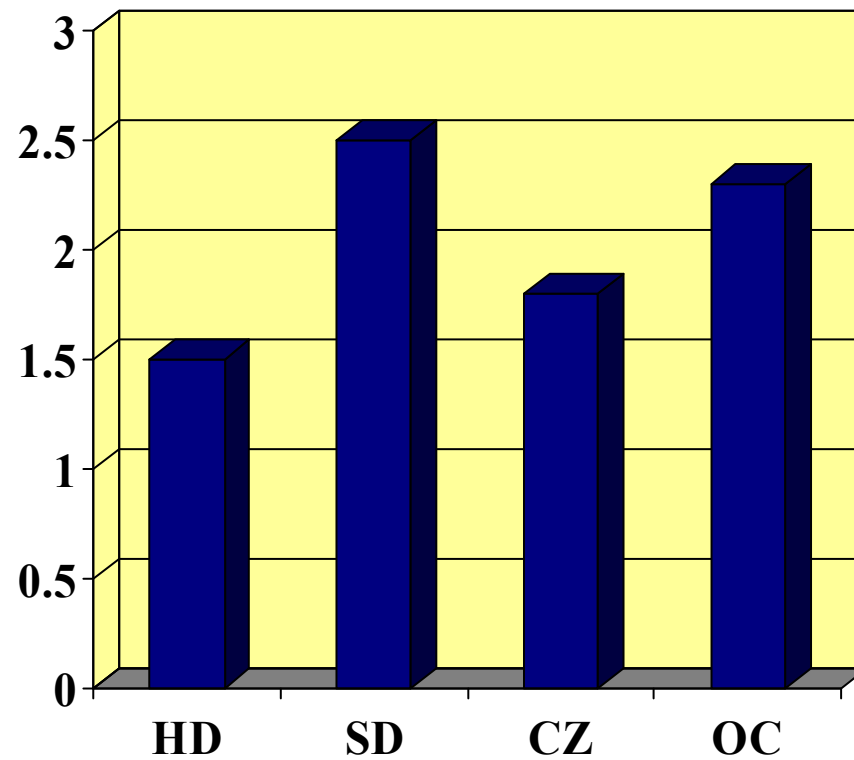
SPATIAL BEHAVIOR

BENZENE (PPBV)



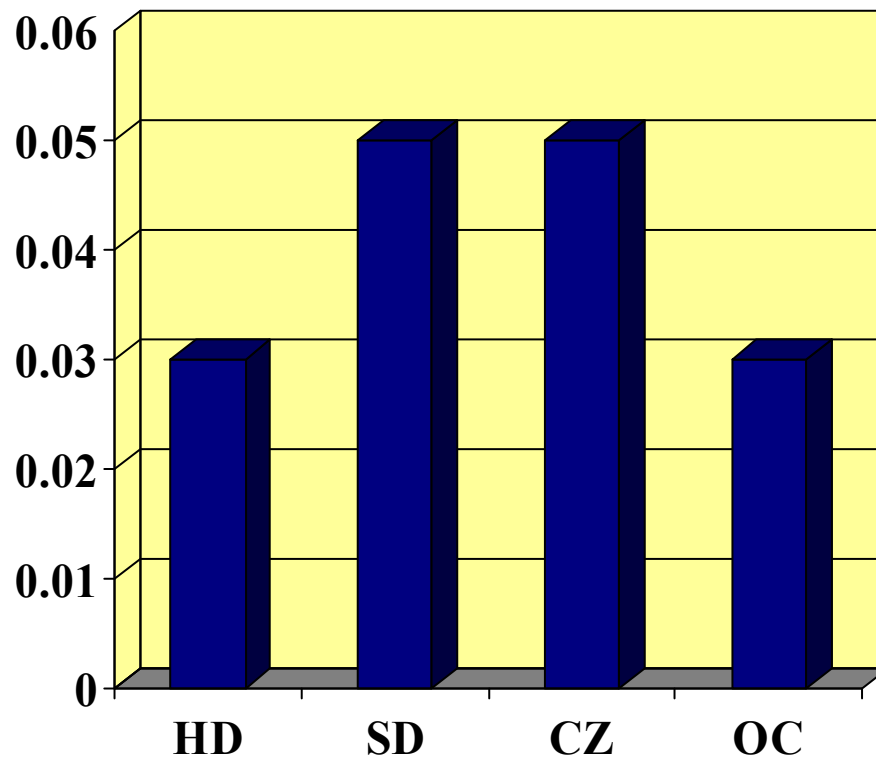
SPATIAL BEHAVIOR

FORMALDEHYDE (PPBV)



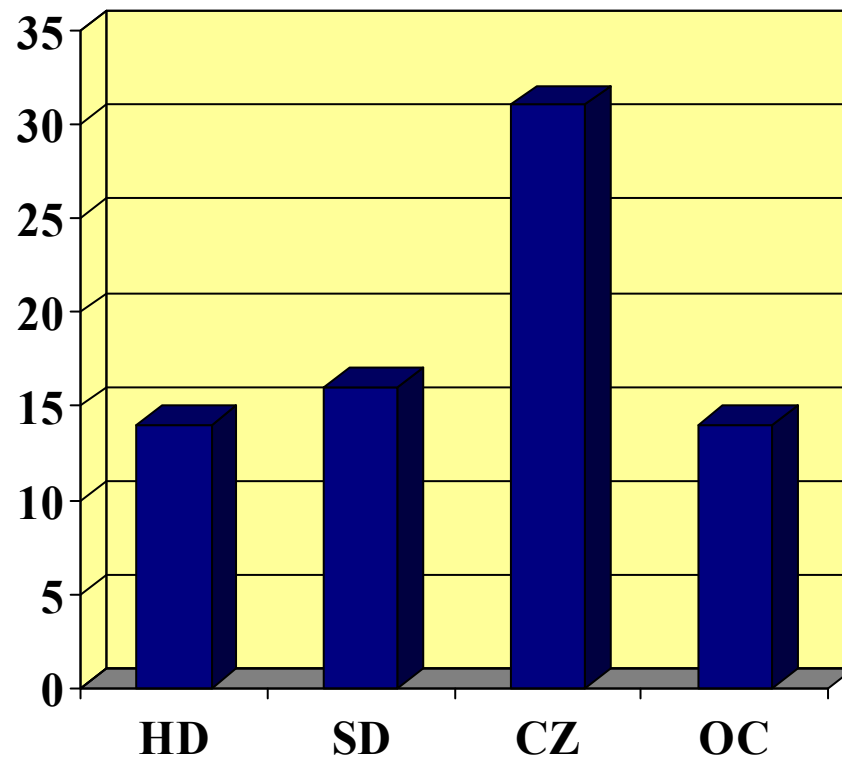
SPATIAL BEHAVIOR

PCE (PPBV)



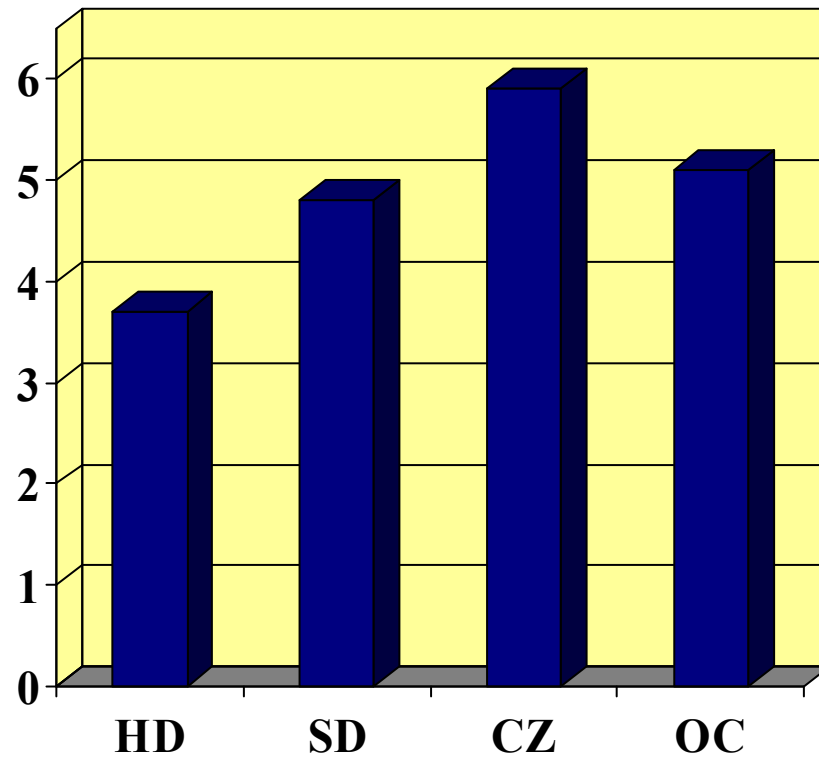
SPATIAL BEHAVIOR

MANGANESE (ng/m³)



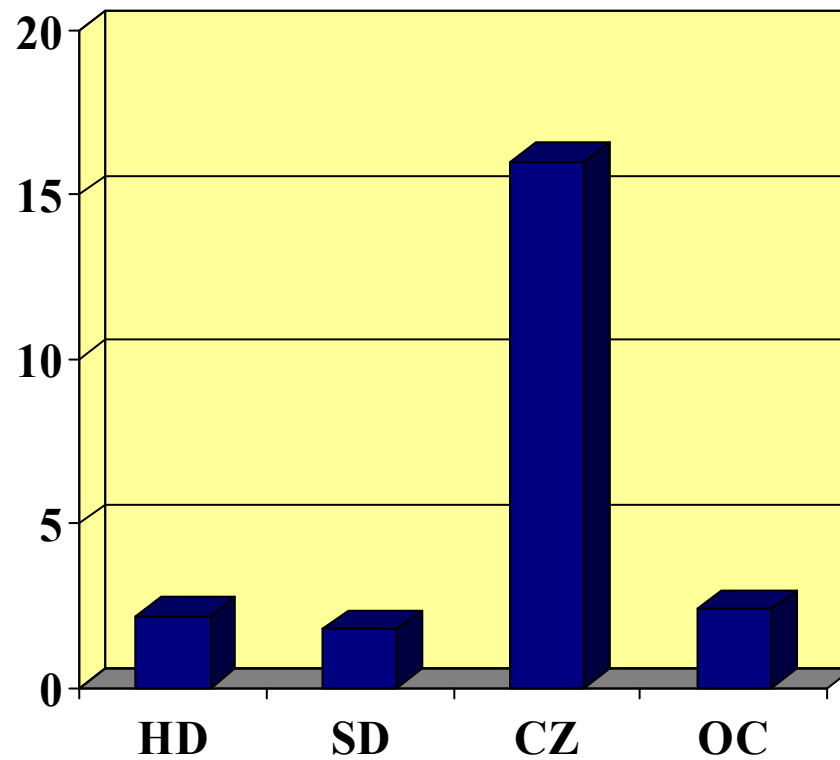
SPATIAL BEHAVIOR

LEAD (ng/m³)

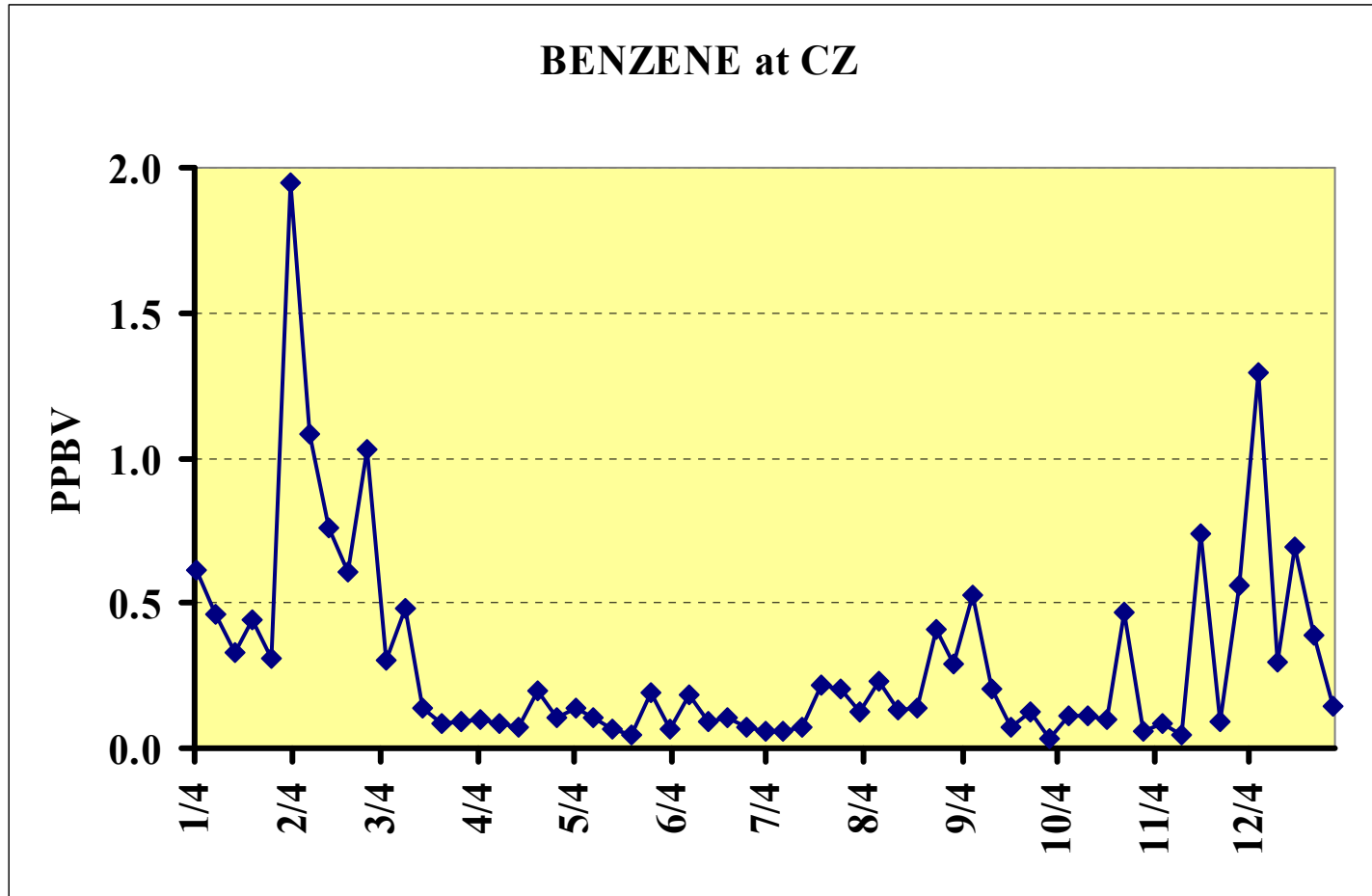


SPATIAL BEHAVIOR

NICKEL (ng/m³)

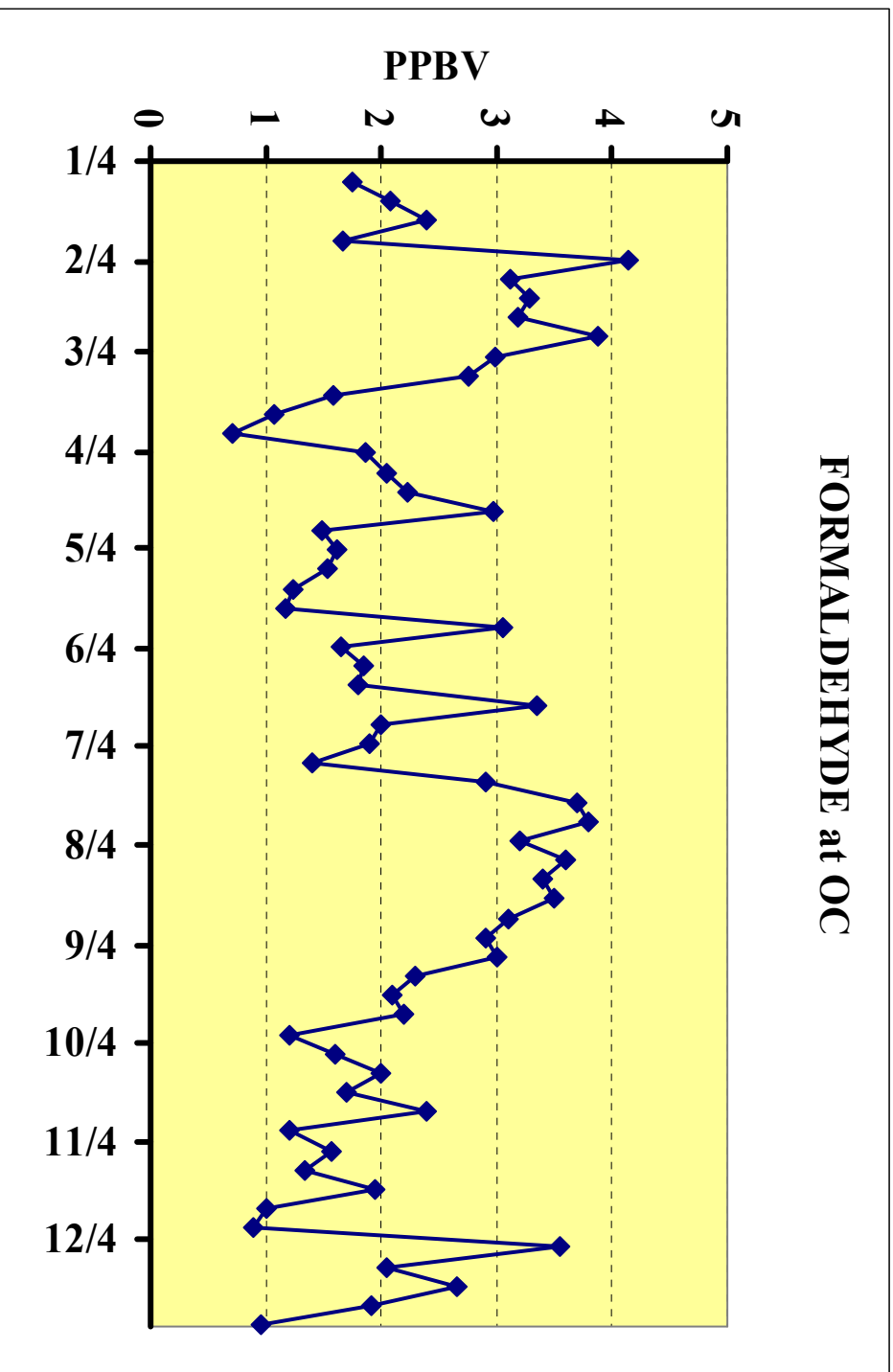


TEMPORAL BEHAVIOR

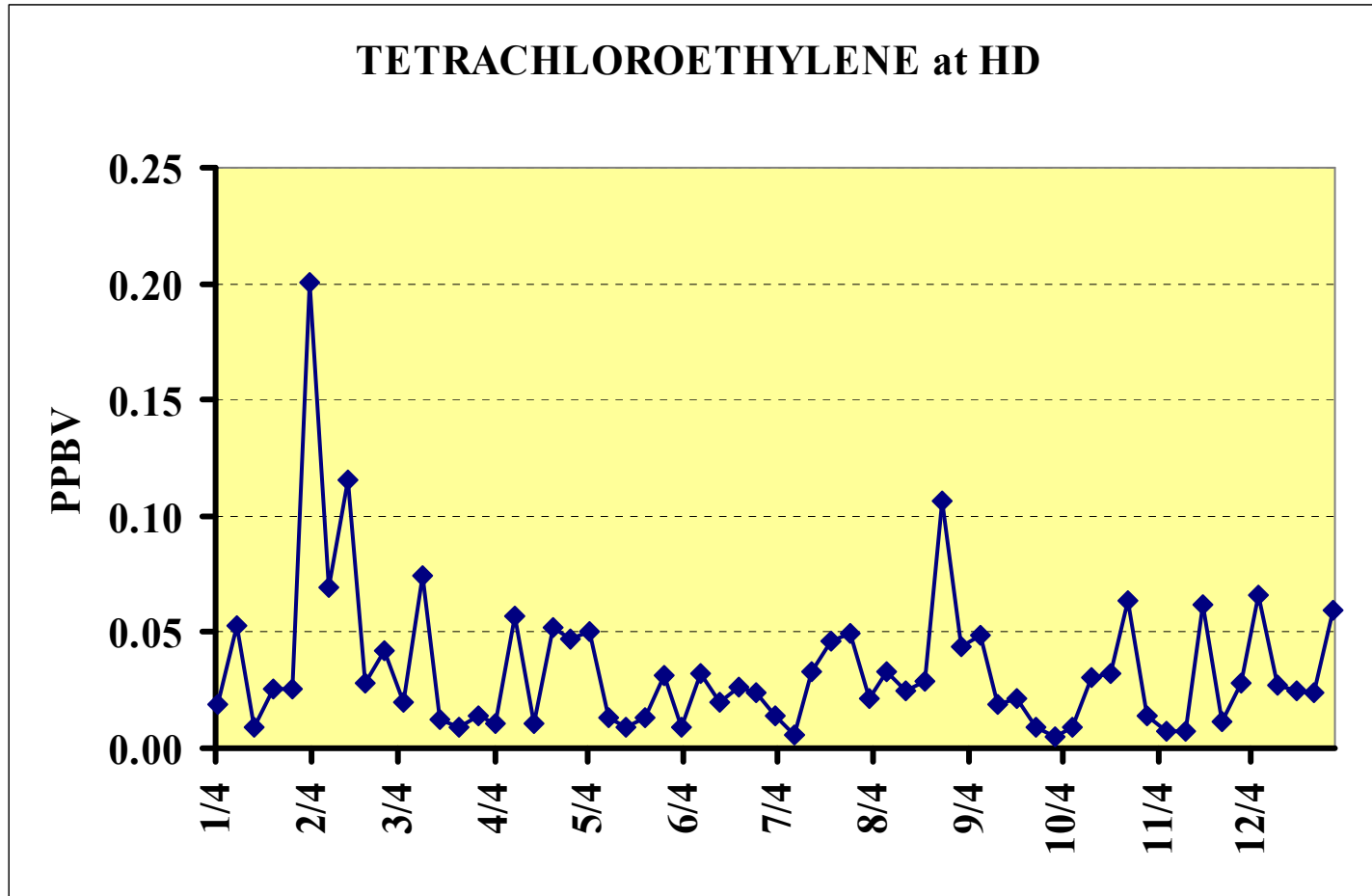


TEMPORAL BEHAVIOR

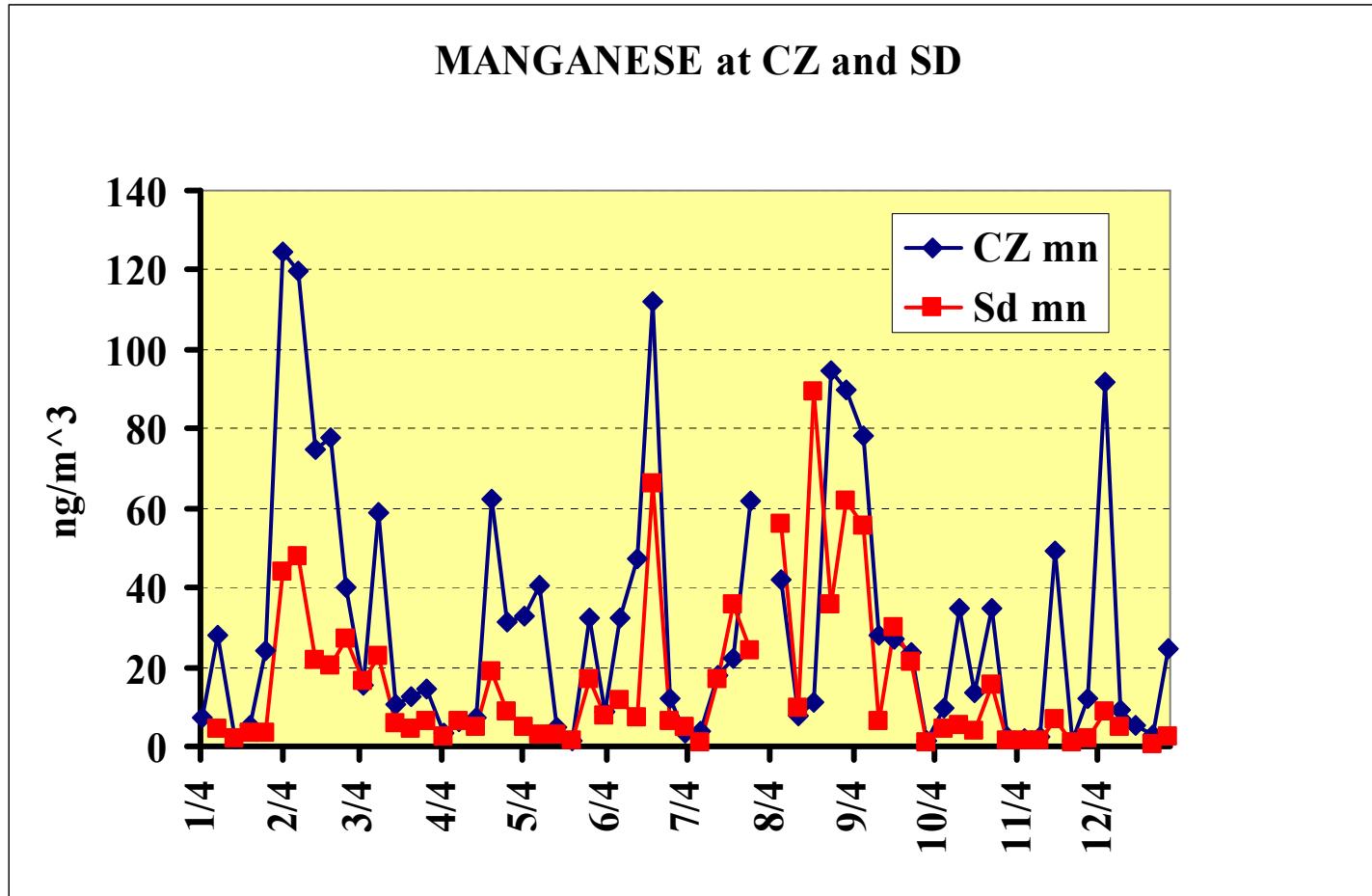
FORMALDEHYDE at OC



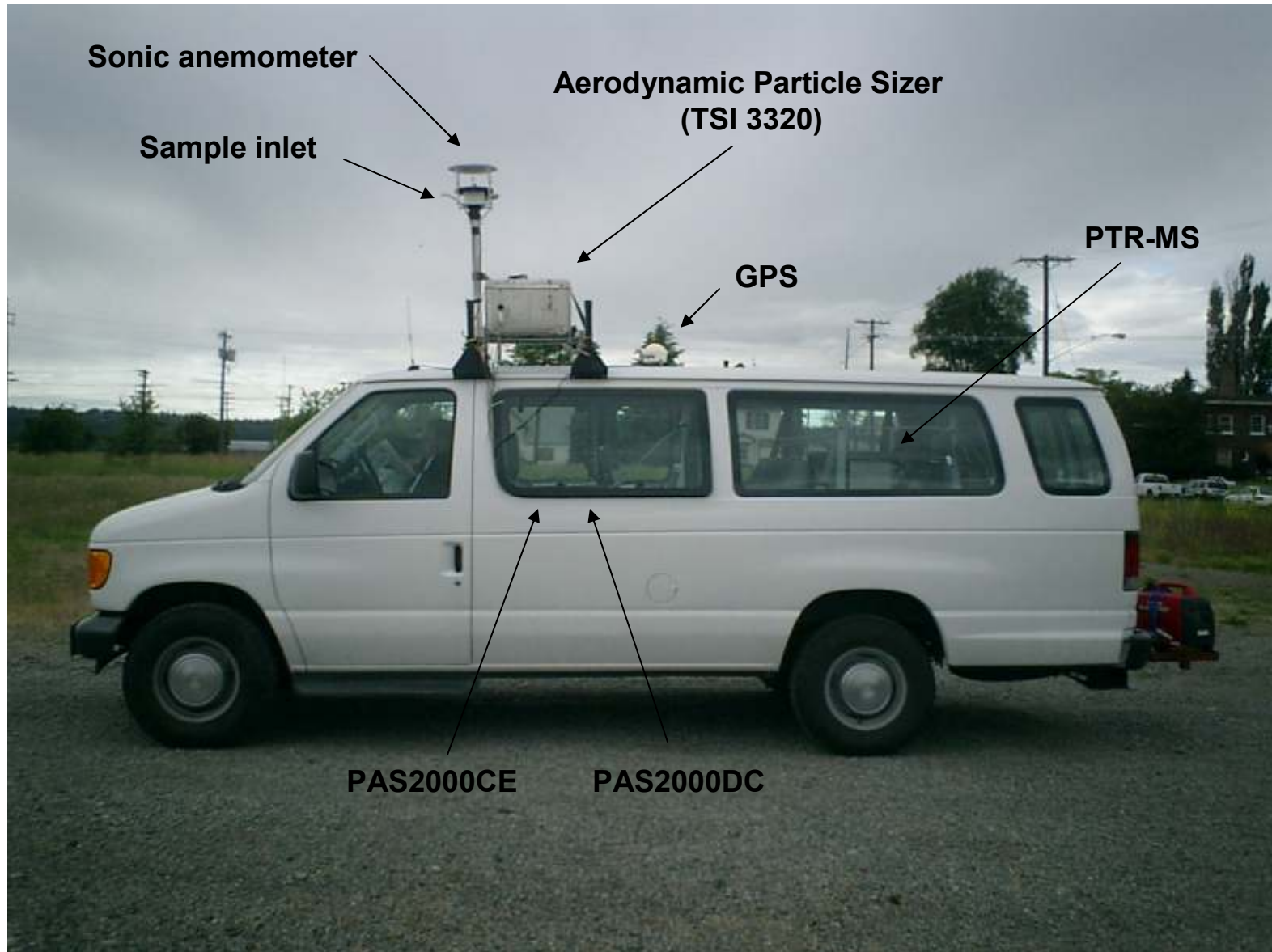
TEMPORAL BEHAVIOR

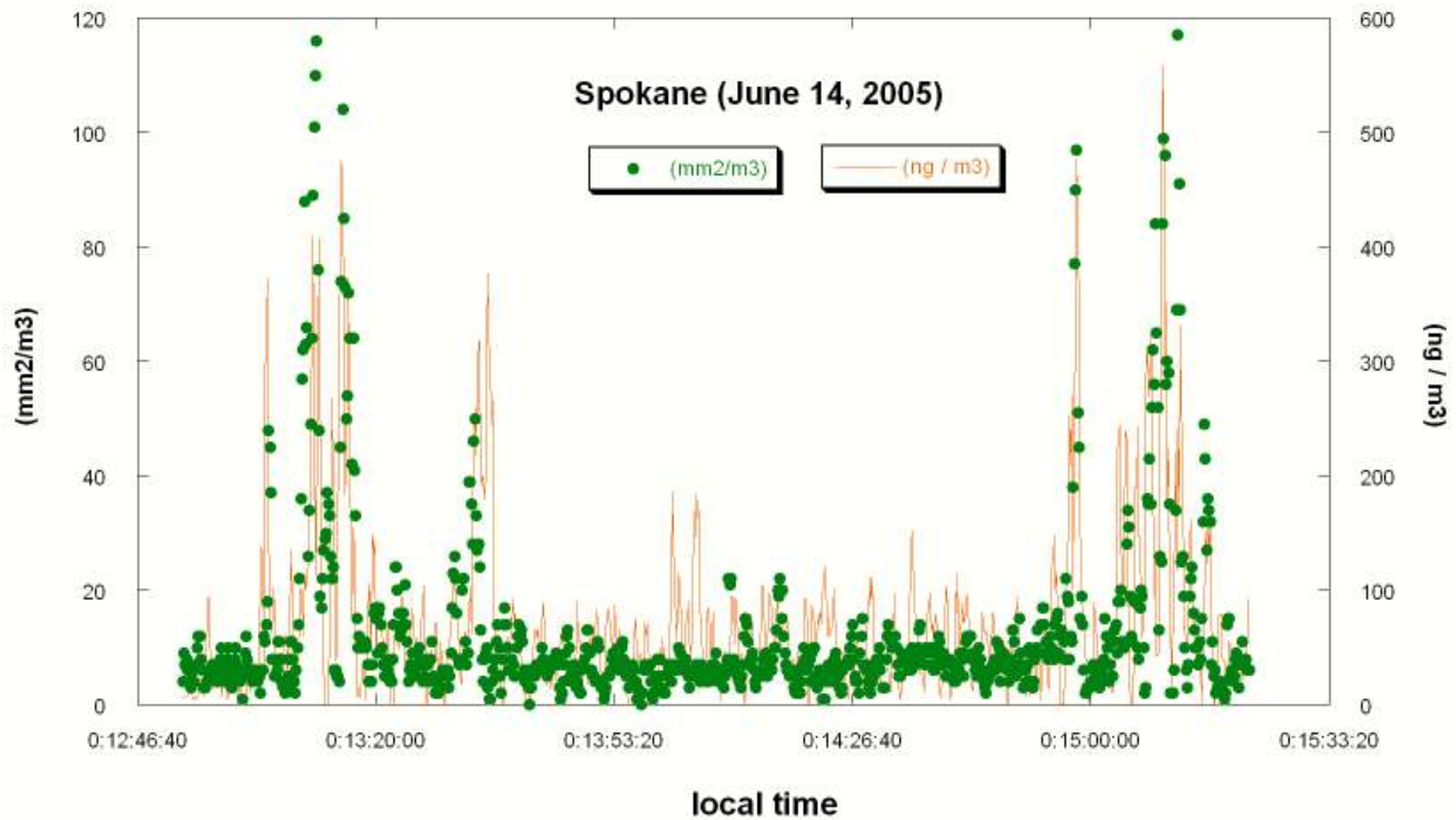


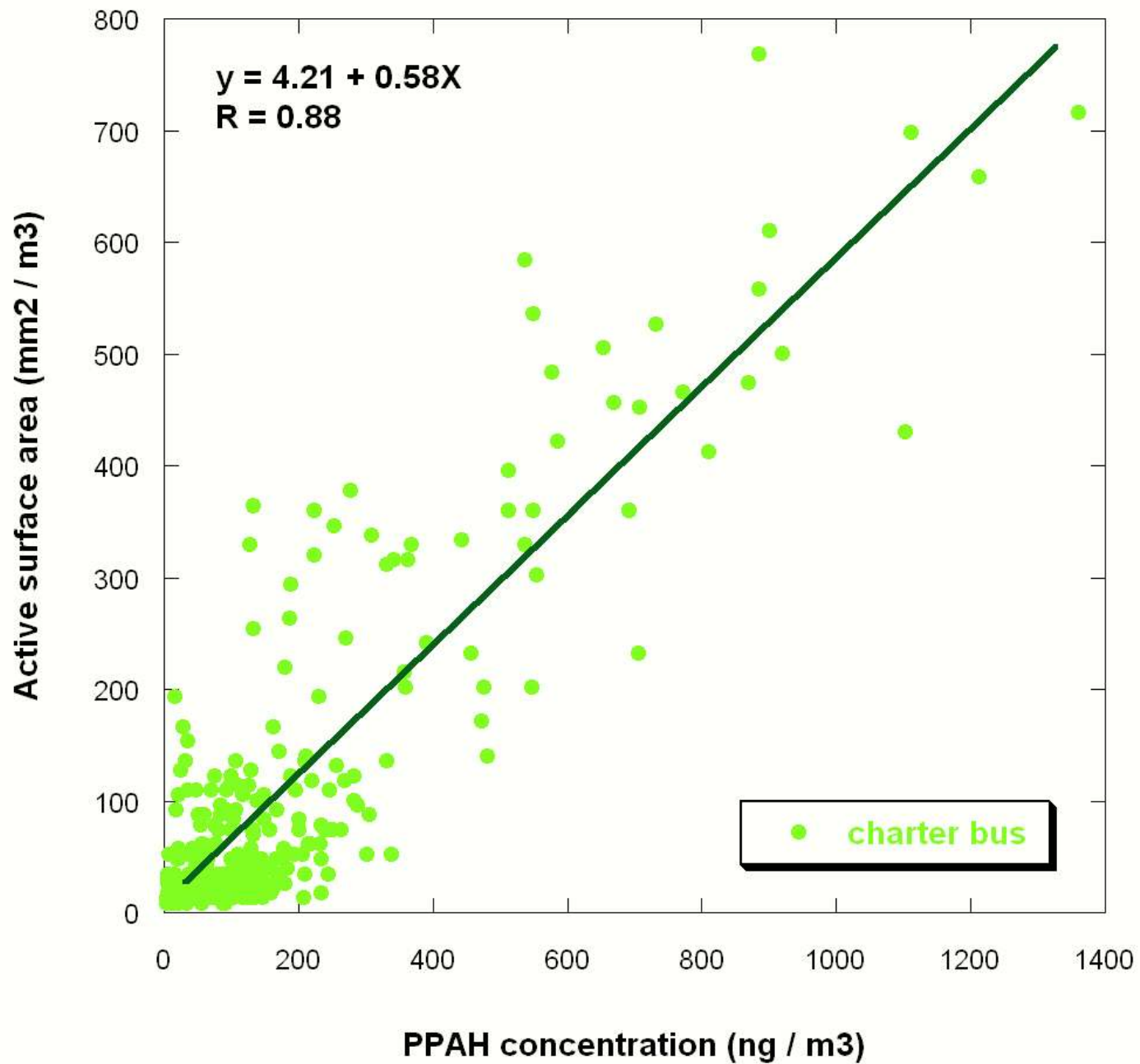
TEMPORAL BEHAVIOR

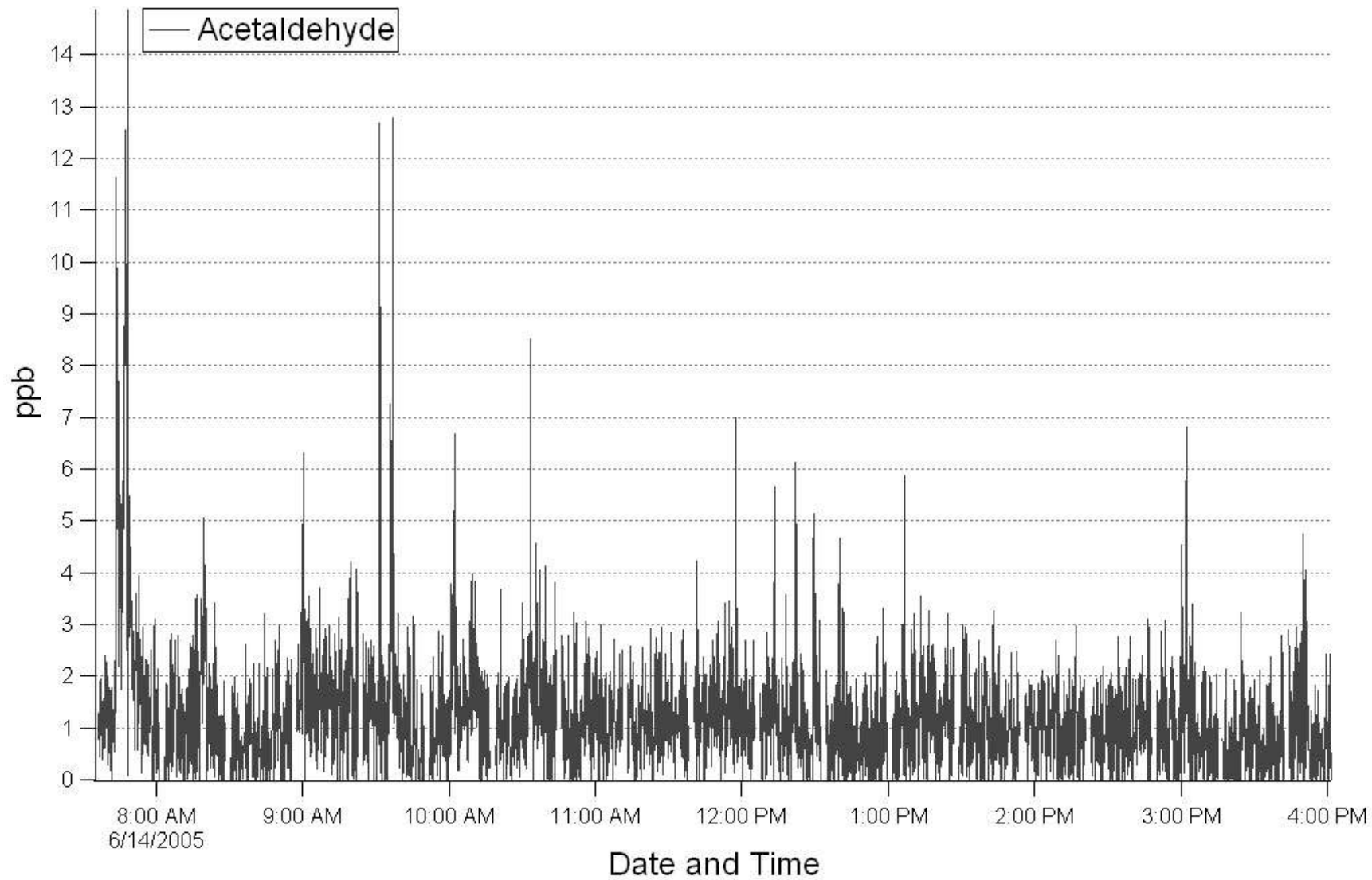


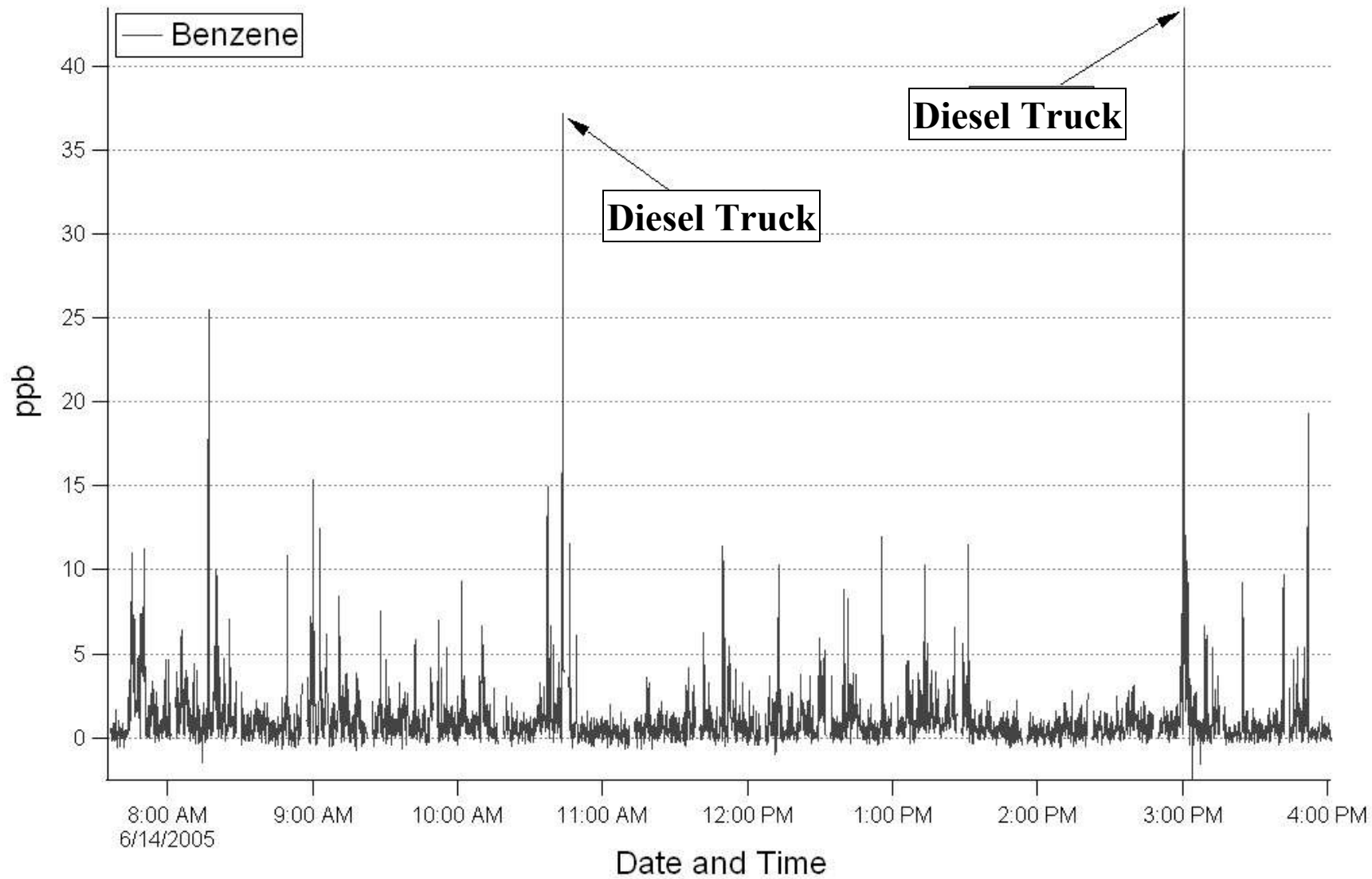
SPECIAL STUDIES

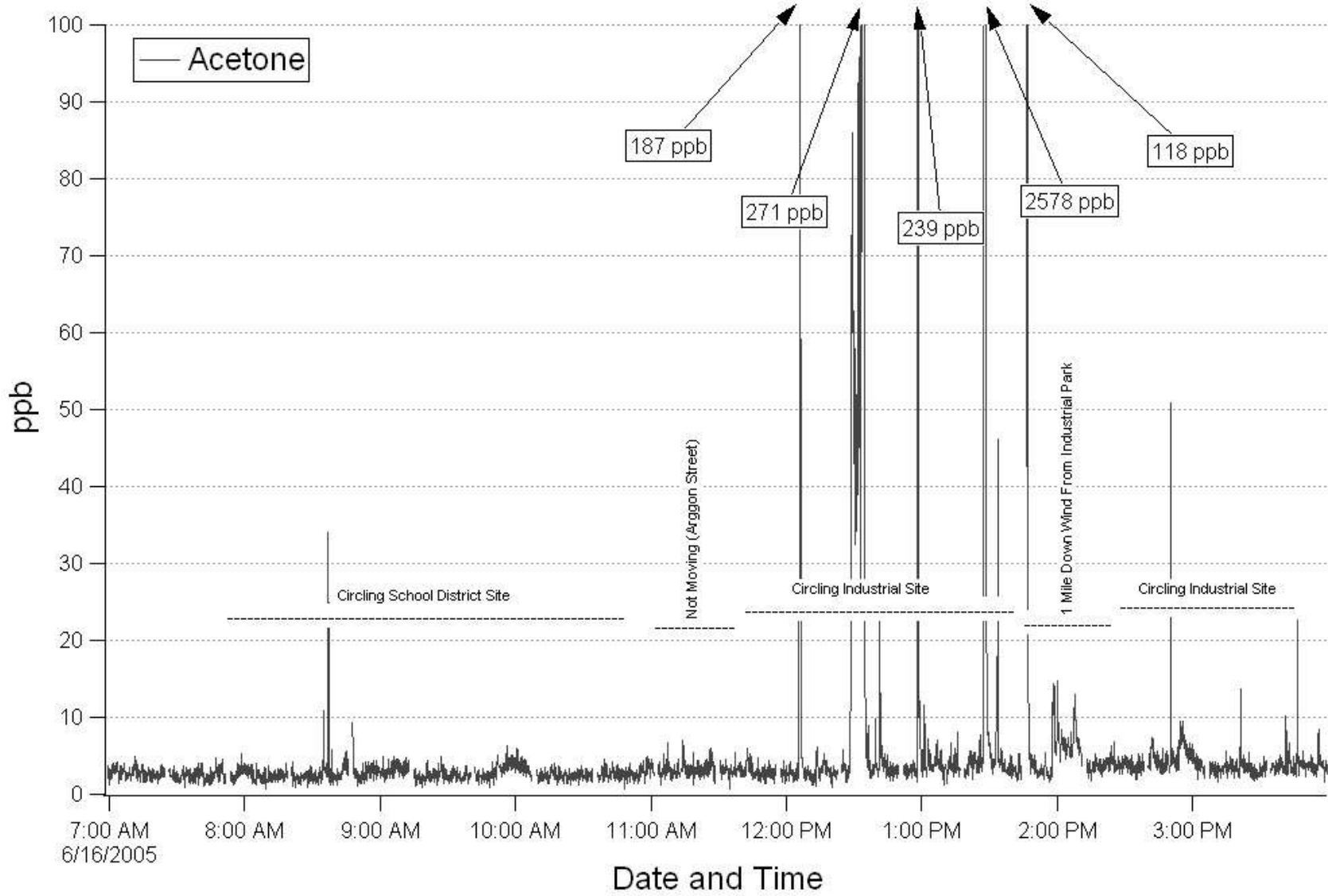


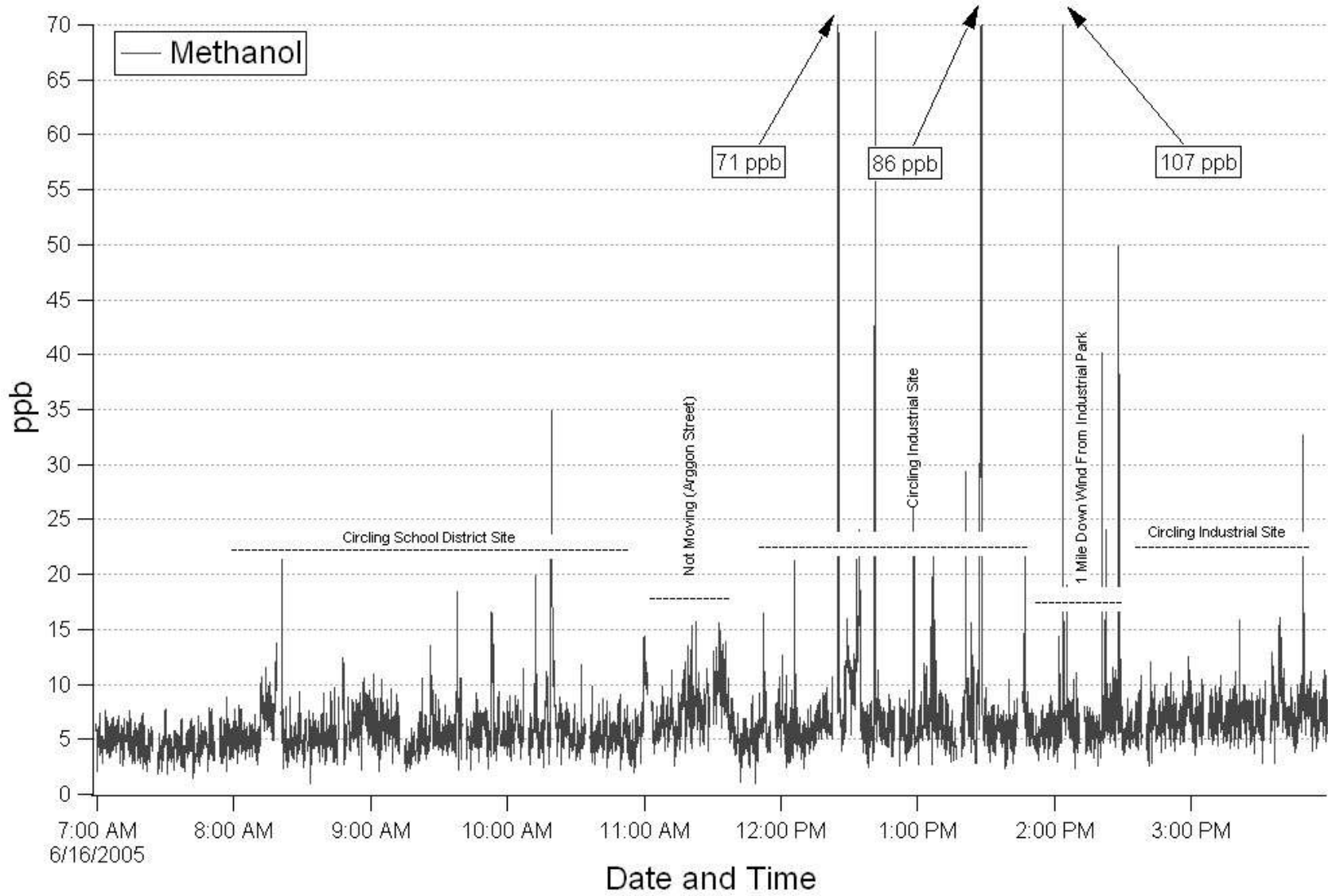


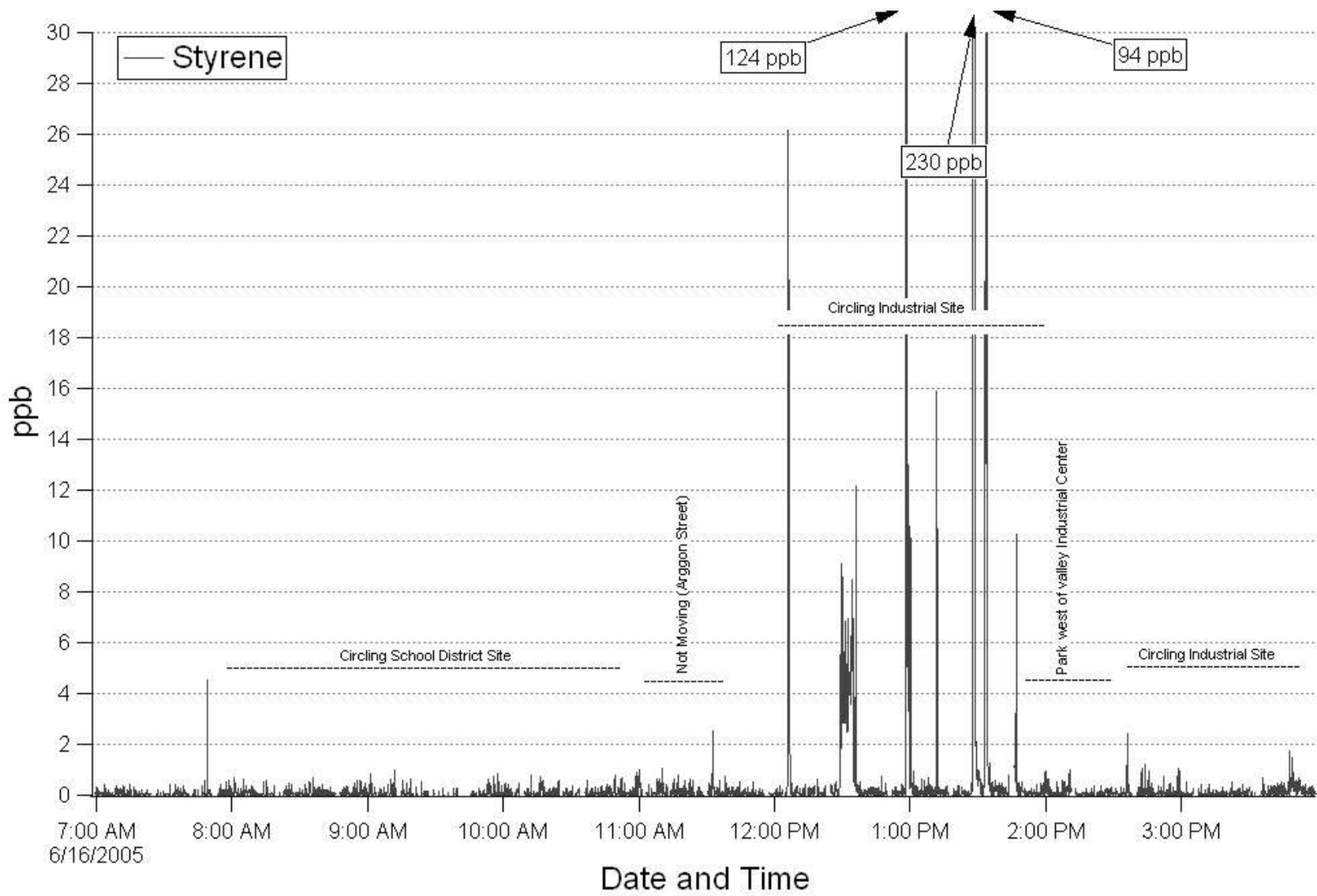


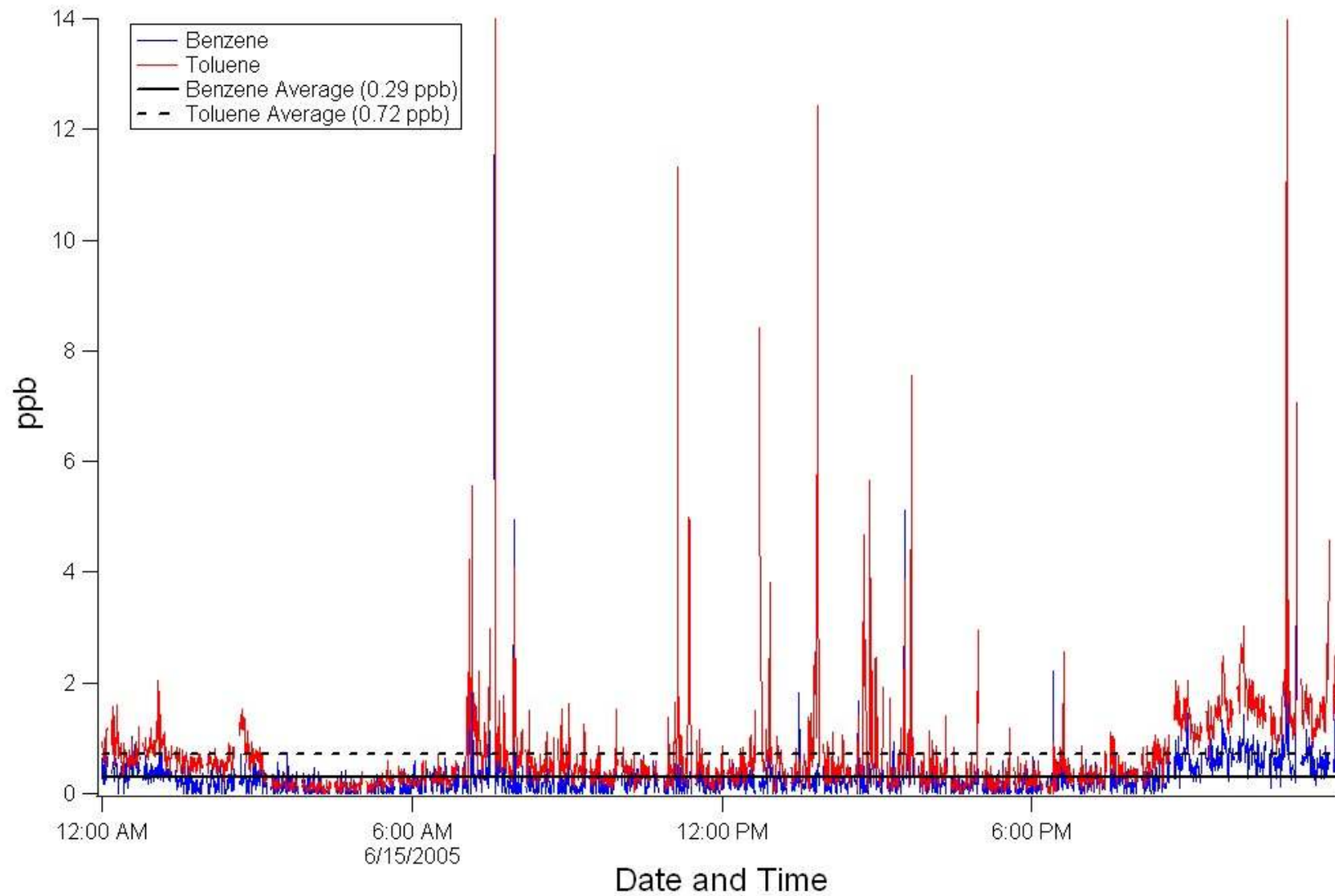




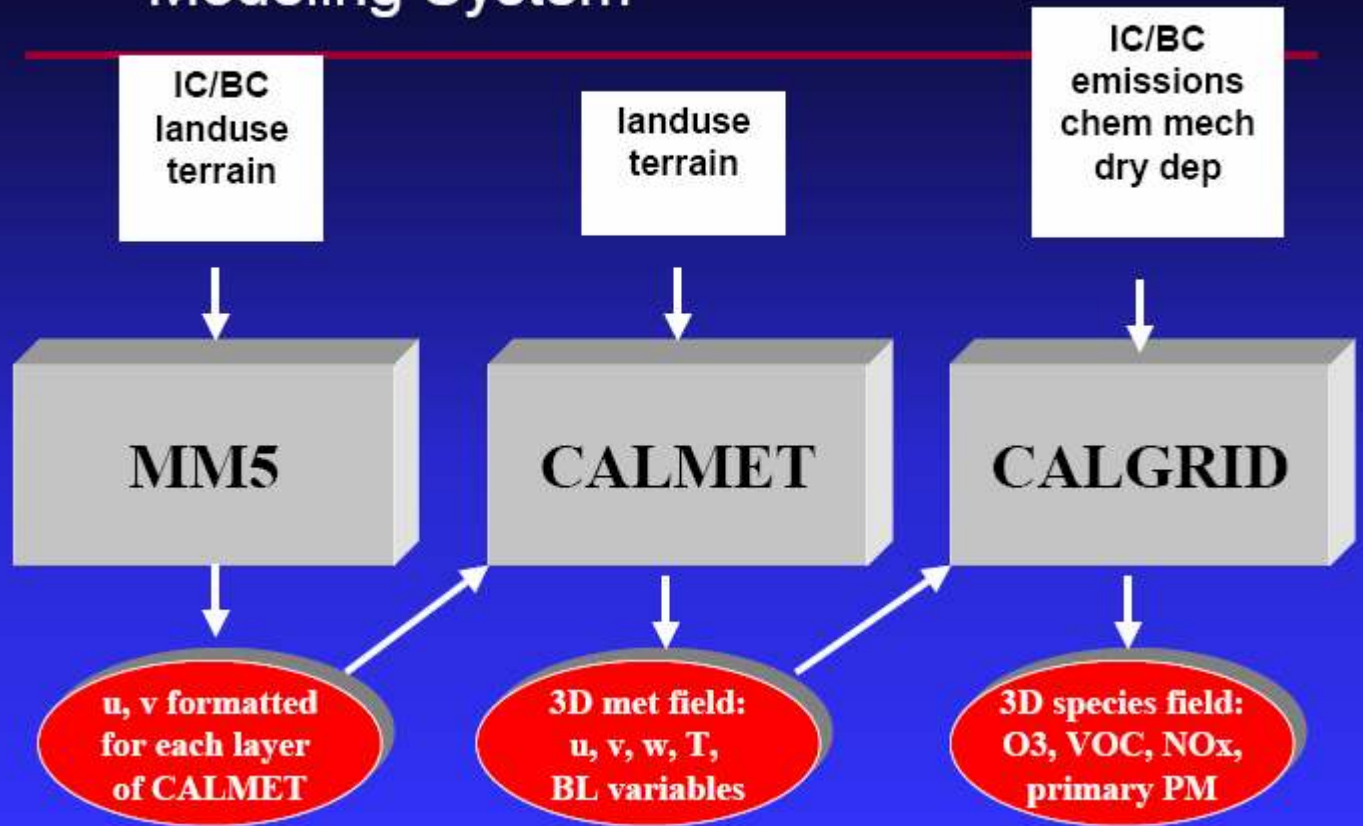




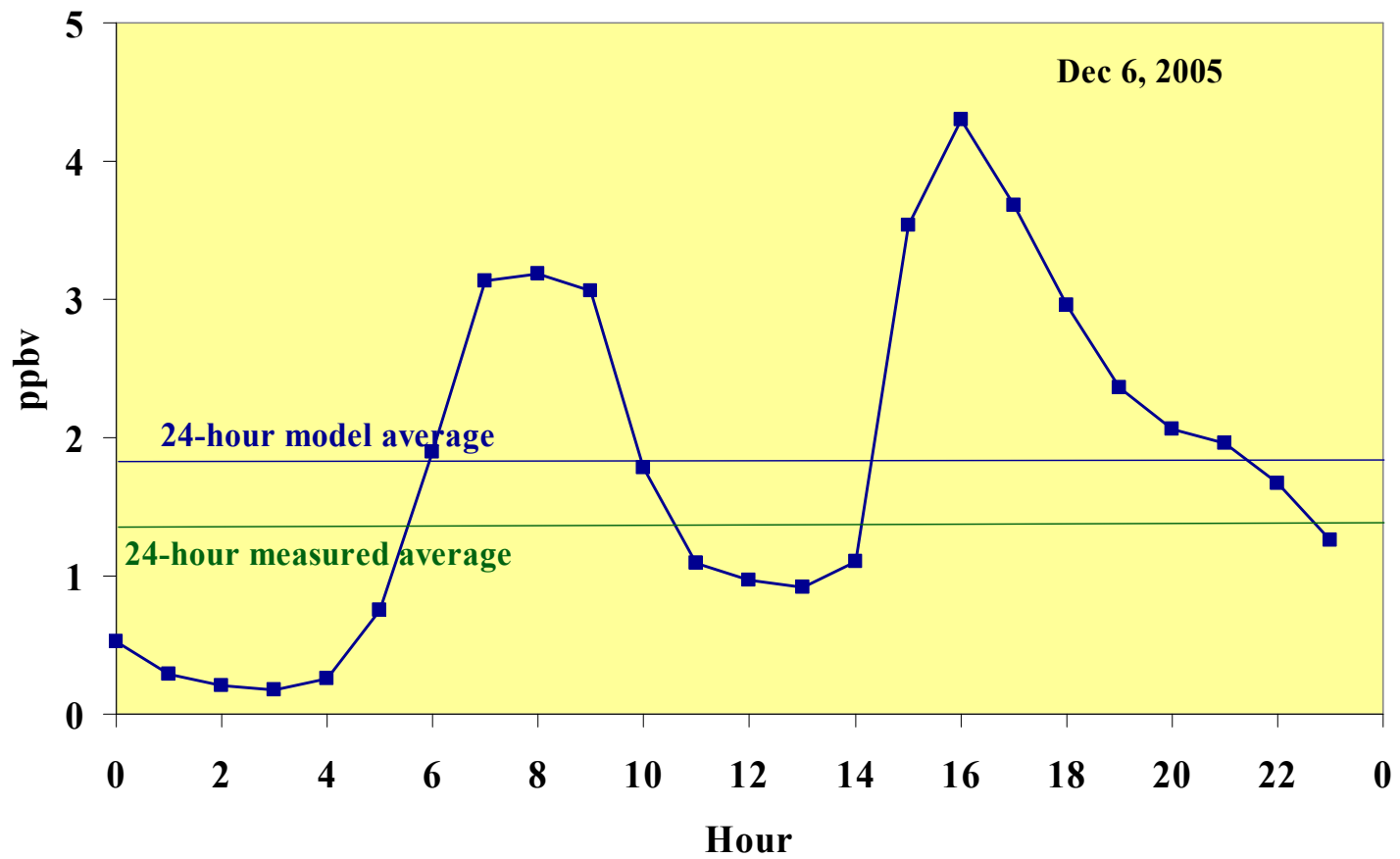




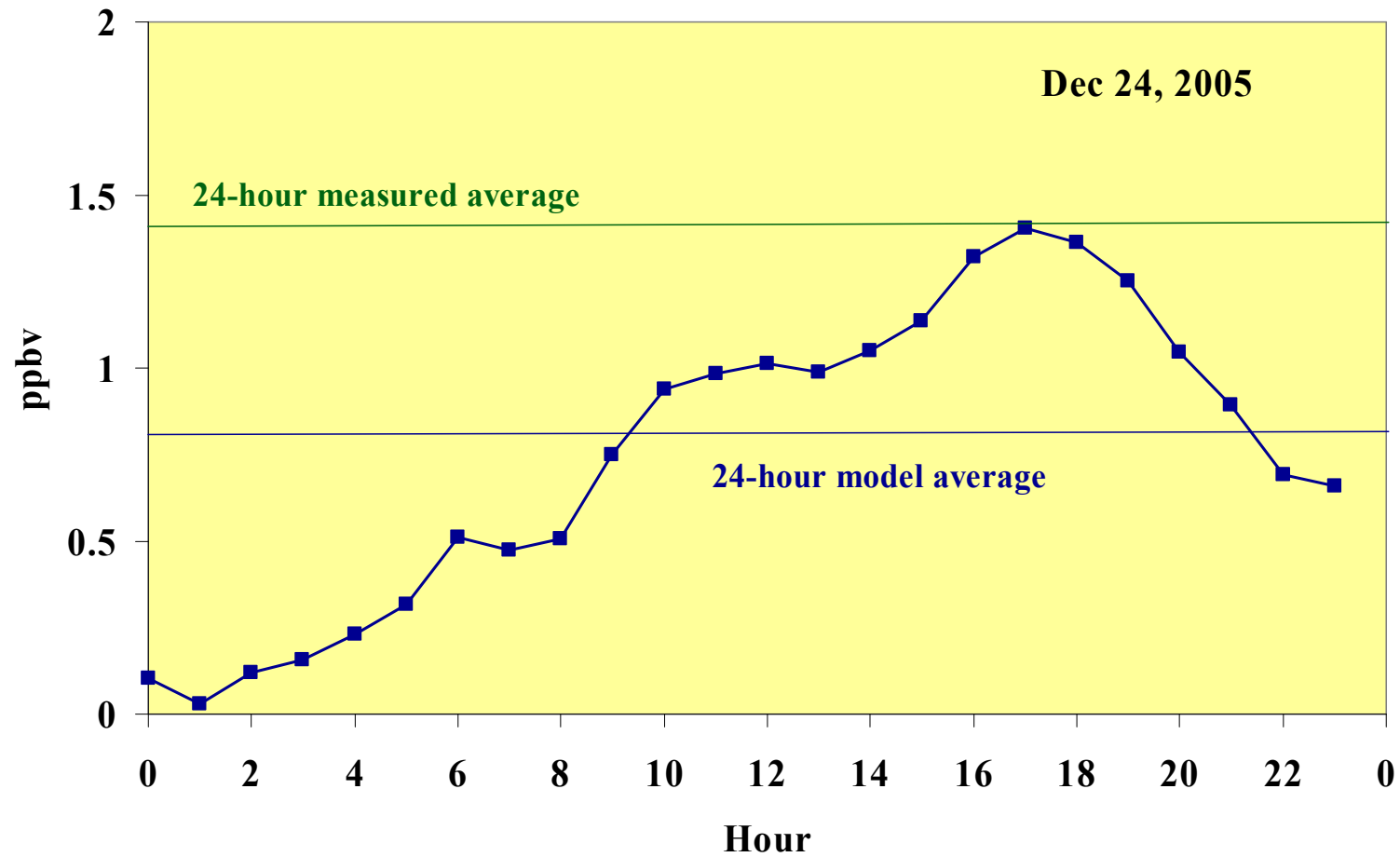
AIRPACT Regional Air Quality Modeling System



BENZENE MODEL-MEASURED COMPARISON



FORMALDEHYDE MODEL-MEASURED COMPARISON

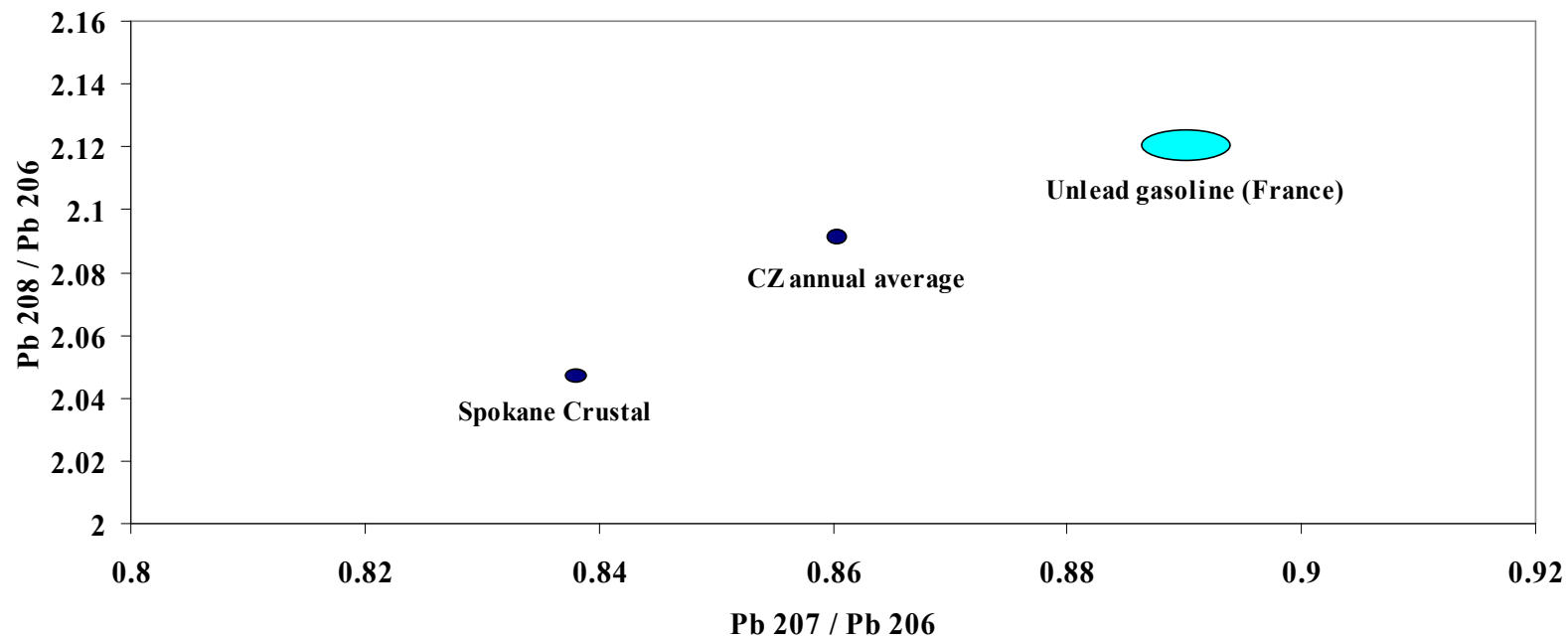


SPOKANE SOURCE APPORTIONMENT LEAD-BENZENE CORRELATIONS

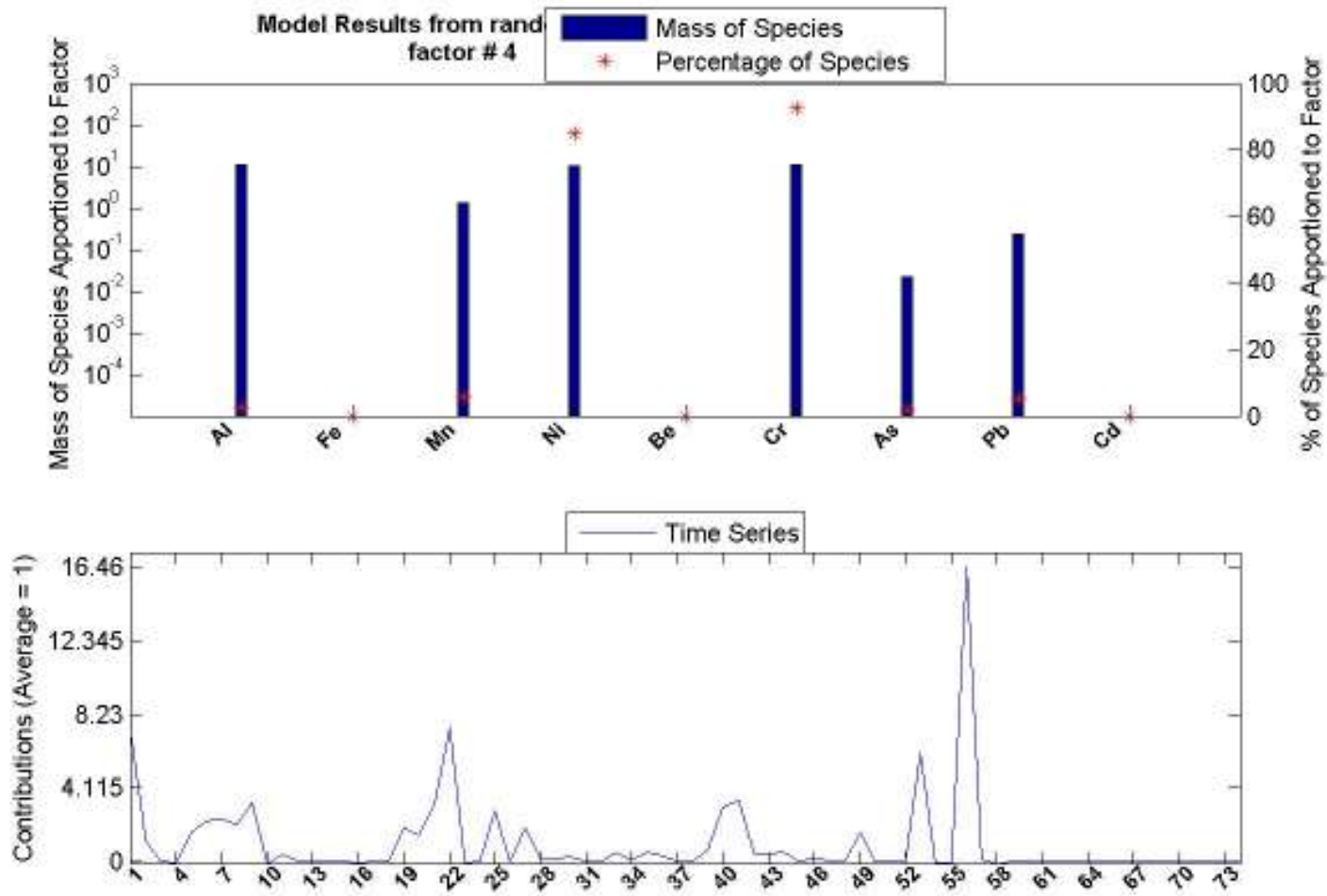
SITE	R²
HD	0.67
SD	0.84
CZ	0.91
OC	0.76

SPOKANE SOURCE APPORTIONMENT

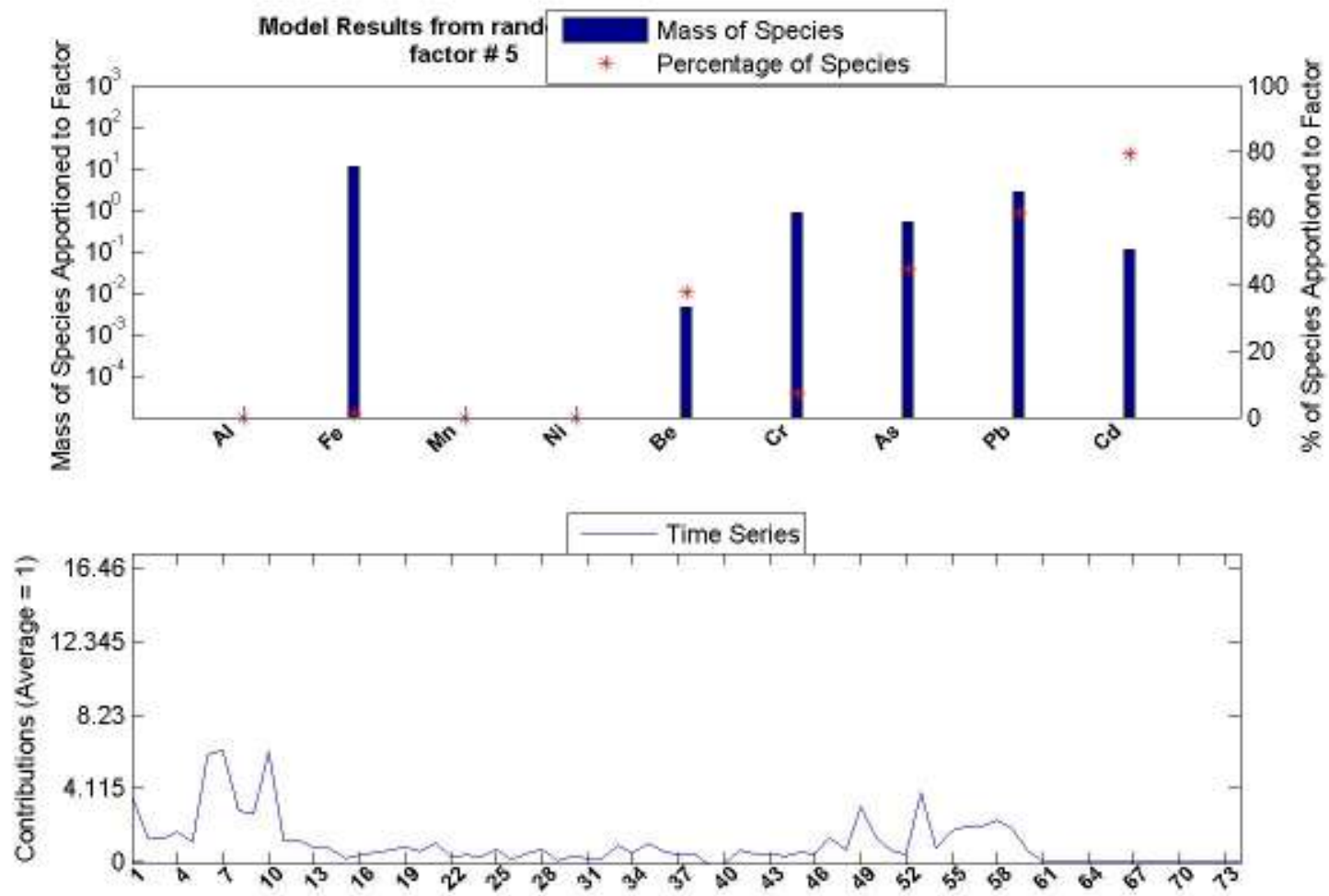
February, Pb 208 / Pb 206 vs Pb 207 / Pb 206 at Four Sites



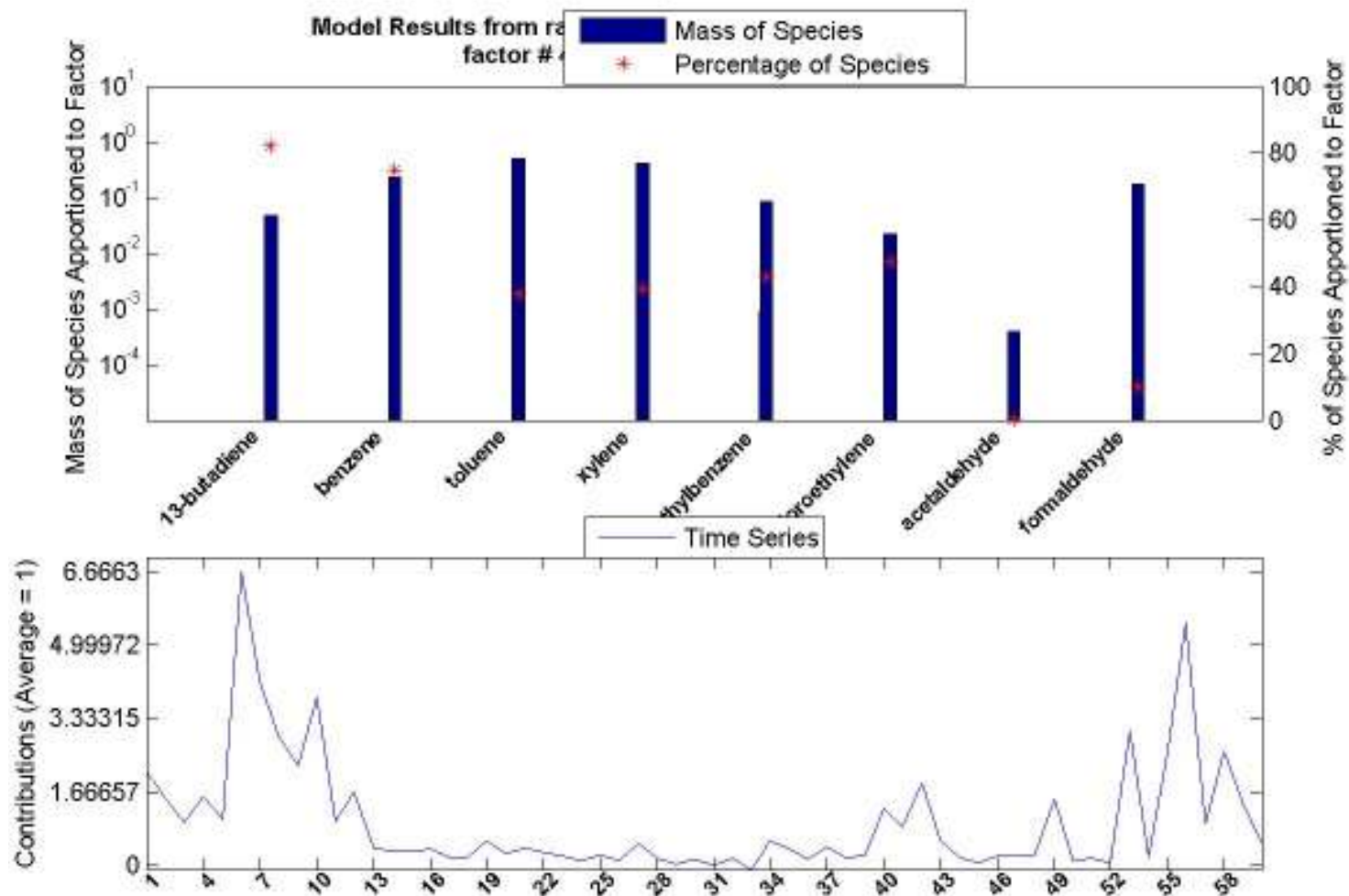
SPOKANE SOURCE APPORTIONMENT



SPOKANE SOURCE APPORTIONMENT



SPOKANE SOURCE APPORTIONMENT



SUMMARY

AMBIENT VOC CONCENTRATIONS

(ppbv)	SPOKANE	SEATTLE	PILOT CITIES
BENZENE	0.24	0.18	0.53
1,3-BUTADIENE	0.05	0.03	0.05
CARBONTET	0.11	0.10	0.10
CHLOROFORM	0.01	0.05	0.04
PCE	0.04	0.03	0.04
TCE	0.02	0.03	0.06
FORMALD	2.0	1.1	3.3
ACETALD	1.4	0.8	1.1

SUMMARY

AMBIENT METALS CONCENTRATIONS

(ng/m ³)	SPOKANE	SEATTLE	PILOT CITIES
ARSENIC	0.9	1.0	1.9
CADMIUM	0.2	0.2	0.2
CHROMIUM	4.8 (1.0)	1.3	1.0
LEAD	4.9	4.4	10
MANGANESE	19	10	10
NICKEL	5.6 (2.1)	3.1	4.0

SUMMARY

- Ambient concentrations
- Spatial and temporal behavior
- Special studies
 - Mobile Van Sampling
- Source apportionment
 - lead isotopes
 - PMF