

PMF Results

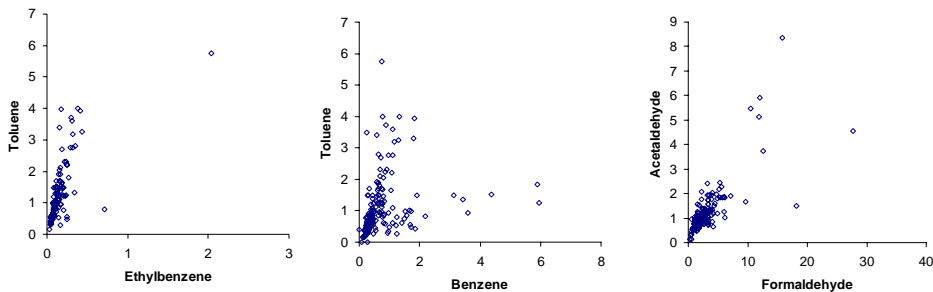
Southwest High School

Data

- 20 Species included
- Uncertainties based on duplicate measurements
- Propionaldehyde, butyraldehyde, and acetone excluded

Parameter	Percent Uncertainty
1,2,4-Trimethylbenzene	24%
1,3,5-Trimethylbenzene	5%
1,3-Butadiene	22%
2,2,4-Trimethylpentane	17%
Acetaldehyde	20%
Acetone	20%
Acetonitrile	14%
Benzene	18%
Butyraldehyde	20%
Chloromethane	12%
Dichlorodifluoromethane	16%
Dichloromethane	20%
Ethylbenzene	18%
Formaldehyde	20%
Freon 113	27%
M/P Xylene	22%
Methyl Ethyl Ketone	22%
N-Hexane	25%
O-Xylene	21%
Propionaldehyde	20%
Tetrachloroethylene	15%
Toluene	16%
Trichlorofluoromethane	13%

Correlations between species

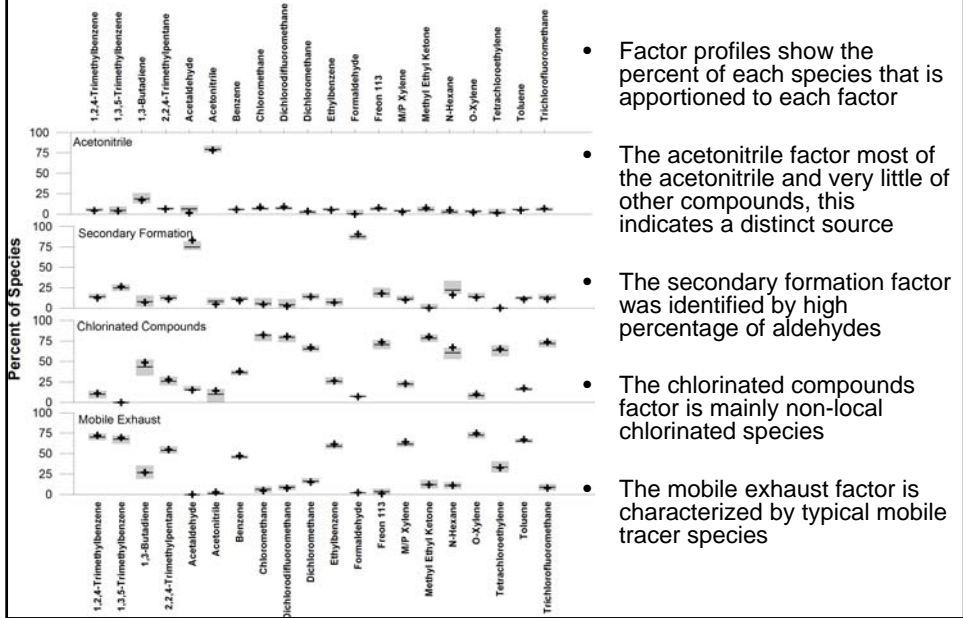


- Mobile source species were well correlated (see ethylbenzene vs toluene plot, above)
- Benzene shows two distinct trends when plotted with mobile source species (see benzene vs toluene plot, above), indicating an additional, non-mobile source of benzene
- Secondary aldehydes are well correlated

Model Diagnostics

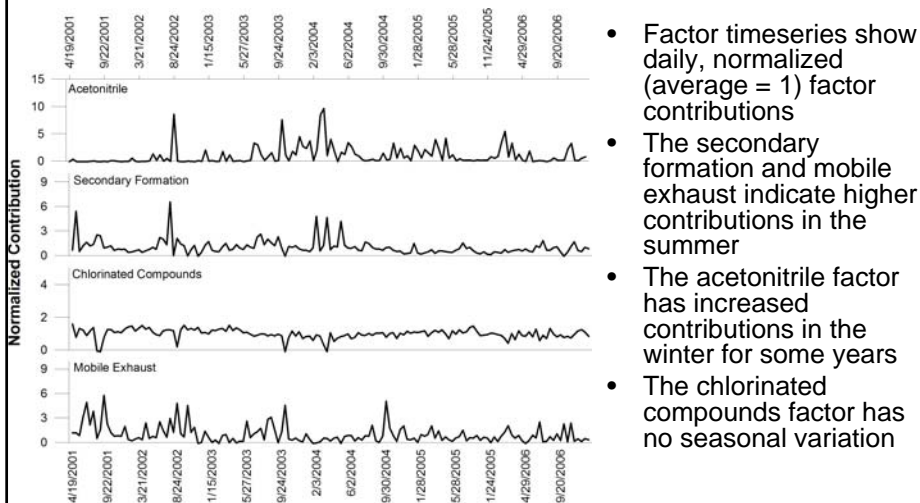
- EPA PMF v2.0 was used for this analysis
- 3-7 factors were explored; a 4 factor solution was chosen as most representative
- F_{peak} values of -0.5 - +0.5 were explored; f_{peak} = -0.1 provided the most stable solution
- Extra modeling uncertainty (c3 value) of 5% was included to improve the stability of the solution

Factor Profiles



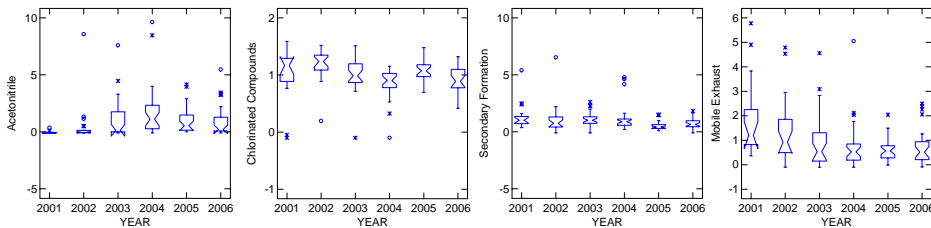
- Factor profiles show the percent of each species that is apportioned to each factor
- The acetonitrile factor most of the acetonitrile and very little of other compounds, this indicates a distinct source
- The secondary formation factor was identified by high percentage of aldehydes
- The chlorinated compounds factor is mainly non-local chlorinated species
- The mobile exhaust factor is characterized by typical mobile tracer species

Factor Time Series



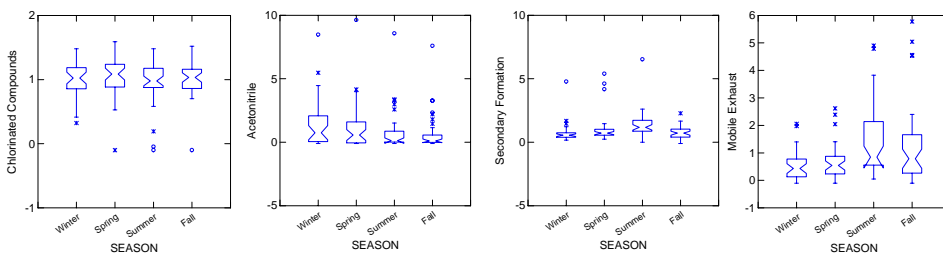
- Factor timeseries show daily, normalized (average = 1) factor contributions
- The secondary formation and mobile exhaust indicate higher contributions in the summer
- The acetonitrile factor has increased contributions in the winter for some years
- The chlorinated compounds factor has no seasonal variation

Factor Contributions by Year



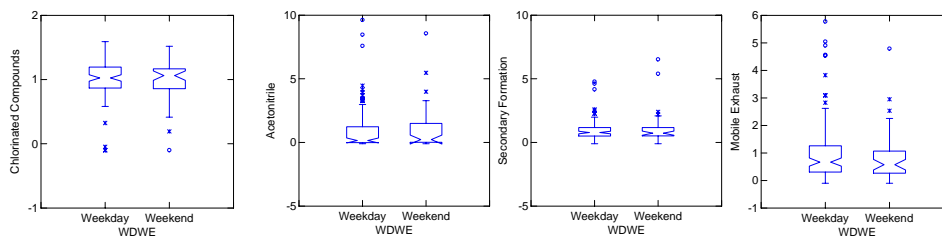
- Normalized contributions shown (average contribution = 1)
- No distinct trends seen for most factors
- Mobile exhaust factor appears to decrease from 2001-2003, but this should not be over interpreted as these years have large confidence intervals

Factor Contribution by Season

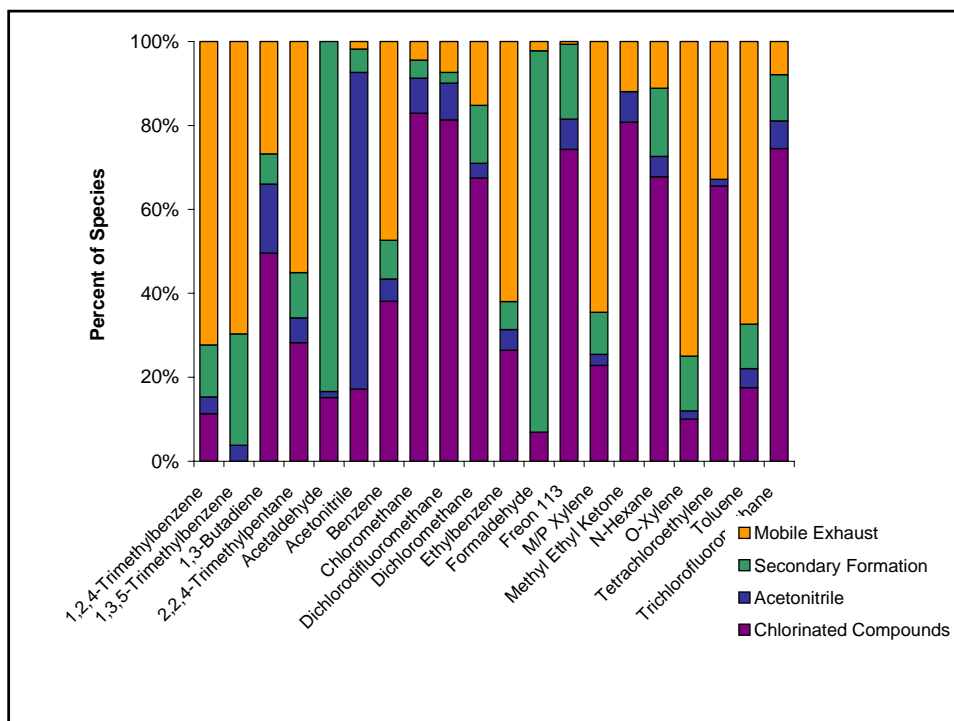


- Normalized contributions shown (average contribution = 1)
- Chlorinated compounds and acetonitrile factors has similar contributions across seasons
- Secondary formation and mobile exhaust factors has higher concentrations in the summer
- Acetonitrile factor has non-significantly higher concentrations in winter and spring

Factor Contributions by Day of Week



- No factors had significant differences in contributions on weekdays vs. weekends



Summary

- PMF was successfully performed on a gaseous air toxics data set at Southwest High School
- Four factors were resolved
- No significant trends in annual concentrations were seen
- Contributions from the secondary formation factor were significantly higher in the summer, due to increased photochemistry
- No significant day of week differences were observed
- The usefulness of this analysis could be expanded, and more factors potentially identified, with additional species/samples