EPA Community Air Toxics Grant:
PAH Measurements Using Passive and Active Techniques
“CALIBRATING CONCERN ABOUT PAHS IN URBAN AIR USING MONITORING AND MODELING”

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MDH Department of Health
Sampling Locations
Active and Passive Air Sampling
Sampling Locations
Chemical Analysis

- Extract: XAD-4 and Quartz fiber filters
  - Dionex ASE-350

- Separate: Varian Select PAH column
  - 30m x 0.25mm (0.14µm film thickness)

- Detect: Agilent 5977 GC/MS, SIM (selective ion monitoring)
Calibration of Passive Samplers

Sampling Rate (m$^3$ day$^{-1}$) = \( \frac{C_{PAS}}{C_{AIR} \times \text{Sampling Duration (days)}} \)

- $C_{PAS} = \text{mass of specific PAH on passive sampler media (ng)}$
- $C_{AIR} = \text{concentration of specific PAH in air (ng m}^{-3}\text{)}$

by SEASON AND STUDY LOCATION
Air Sampling Rates for Passive Samplers by Season
Active Sampling Rate is 173
Air Sampling Rates for Passive Samplers by Study Location
Active Sampling Rate is 173
Collocated Benzo(a)pyrene Results at Near Roadway
MNRiskS
(Minnesota Risk Screening)

A multi-source, air pollution risk model

Developed by
Lakes Environmental Consultants, Ontario
and
Minnesota Pollution Control Agency
Increasing Modeled Air Concentrations
Total Measured PAHs and Mean Modeled PAHs within a 1km Buffer

substance
- 2-Methynaphthalene
- 3-Methylcholanthrene
- 5-Methylchrysene
- 7,12-Dimethylbenz[a]anthracene
- Acenaphthene
- Acenaphthylene
- Anthracene
- Benz[a]anthracene
- Benzo[a]pyrene
- Benzo[b]fluoranthene
- Benzo[e]pyrene
- Benzo[g,h,i]perylene
- Benzo[k]fluoranthene
- Dibenz[a,h]anthracene
- Dibenz[a,j]acridine
- Fluoranthene
- Fluorene
- Indeno[1,2,3-cd]pyrene
- Naphthalene
- Pyrene

average modeled

Total _ observed
Total Measured PAHs and Average Modeled PAHs within a 1km Buffer

substance
- 2-Methylnaphthalene
- 3-Methylcholanthrene
- 7,12-Dimethylbenz[a]anthracene
- Acenaphthene
- Acenaphthylene
- Anthracene
- Benz[a]anthracene
- Benzo[a]pyrene
- Benzo[b]fluoranthene
- Benzo[e]pyrene
- Benzo[g,h,i]perylene
- Benzo[k]fluoranthene
- Dibenz[a,h]anthracene
- Dibenz[a,j]acridine
- Fluoranthene
- Fluorene
- Indeno[1,2,3-cd]pyrene
- Naphthalene
- Pyrene

average modeled vs. observed
Thanks!
Questions?

PAHs in Air Project Website: http://www.pca.state.mn.us/yqq4pfk

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