

# *Sealer Ban: Science...and Fiction*



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**Pavement Coatings Technology Council**

*National Pavement Expo Workshop C-21  
Sealcoating: Regulatory Challenges and Industry Initiatives*

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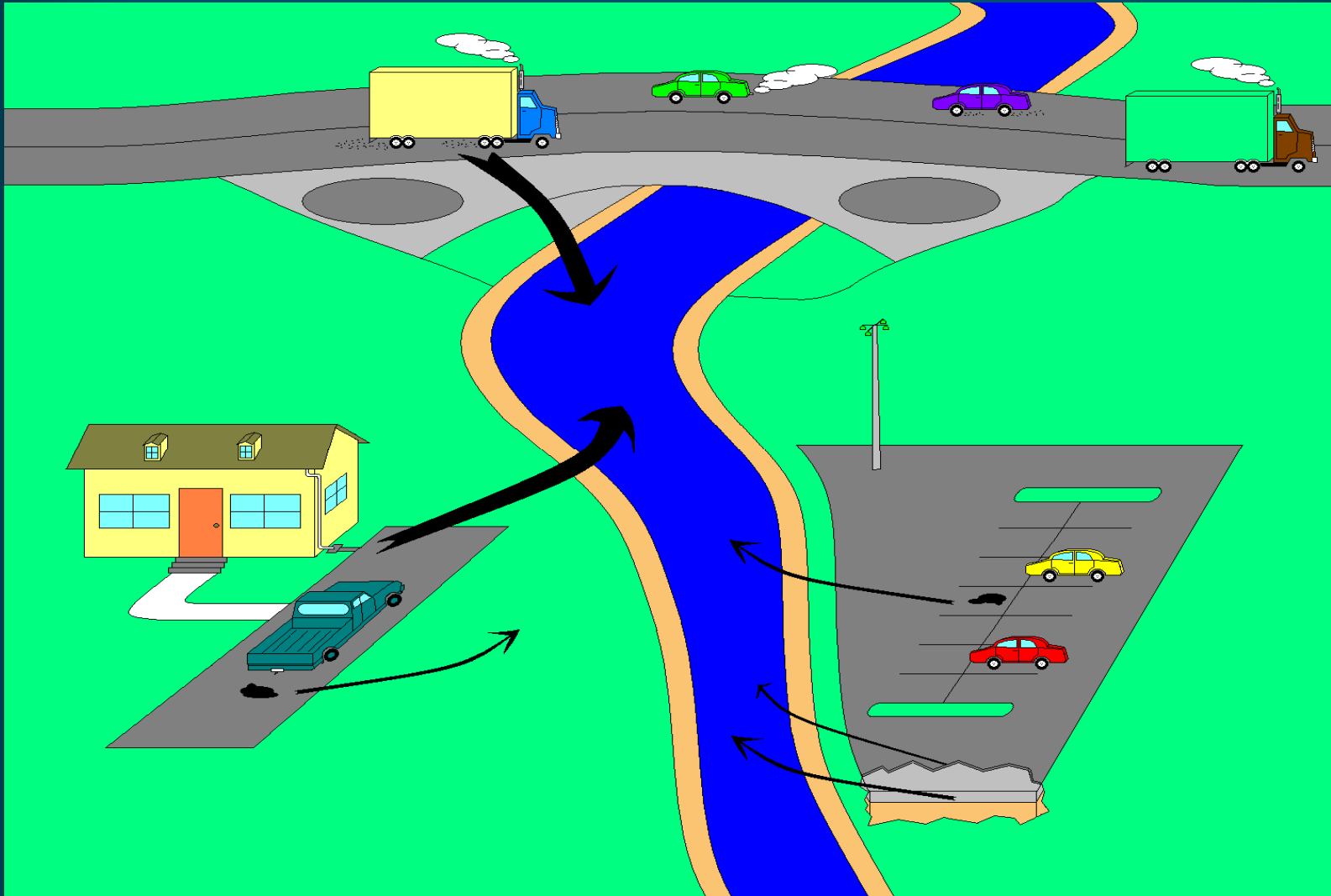
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# Overview

- Sealer environmental concern basics
- Austin, TX
  - Start of the whirlwind
  - Making “science” fit the theory
- Testing Before and After the Ban

# Urban Complexities – Environmental Reality





# Pavement Runoff PAHs

- Asphalt binder from pavement
- Patch and repair products
- Pavement sealer (n/a for roads)
- Deposited auto exhaust
- Motor oil
- Tire rubber



# Background -- PAHs Are Everyday Urban Constituents

- From all combustion processes
  - Vehicle exhaust and power generation
- Present in construction materials
  - Asphalt pavement; roofing; pavement sealers
- Consumer products
  - Shampoos; cosmetics; dyes; medicines; plastics; mothballs

**Managing exposure differentiates “pollution” from dandruff control**



# Shampoos and Topical Gels

## ■ Denorex Shampoo

- Contains percent levels of PAHs (12.5% coal tar solution )
- Not perceived to pollute
- Environmental loading is managed – water treatment





Barton Springs  
Treasured Resource – Agenda Tipping Point



# Austin Agenda – Getting Famous

- **Curious staffer / local “research” initiates cascade**
- **Media creates threat**
- **Agency insight discovers cause**
- **New city council member makes his mark**
- **Agency staffer get to brief “Congress”**







**Asphalt Road  
Material**

**Parking Lot  
Breakdown**

**Drainage Ditch Below Barton Springs Apartments**

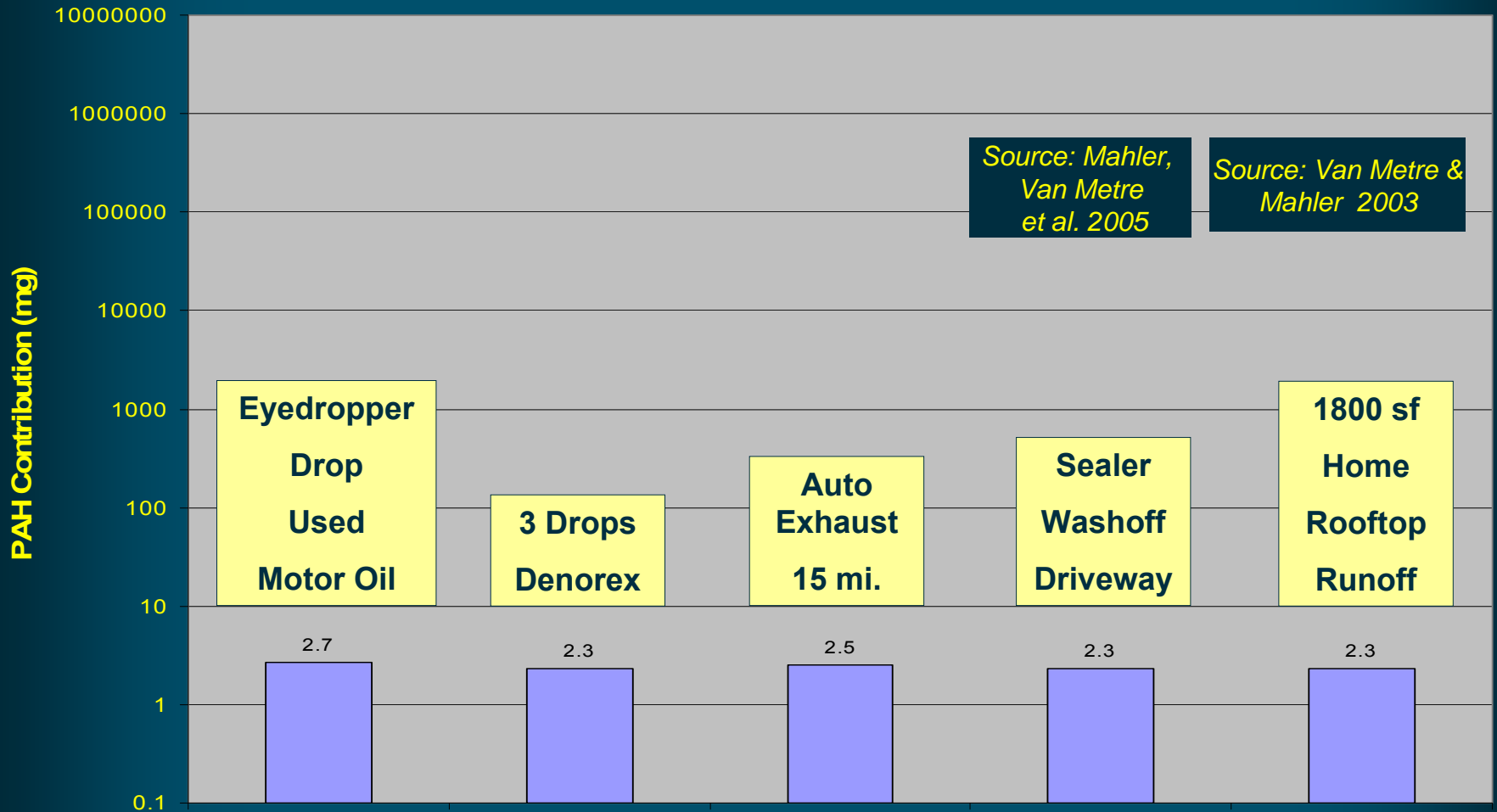


# USGS/CoA 2005 Study

- Mahler, Van Metre, et al. 2005.  
**Parking lot sealcoat: An unrecognized source of urban polycyclic aromatic hydrocarbons.** *ES&T* 39:5560
- Determined PAH amount washed from coal tar pavement sealer
- Could **NOT** detect different PAH input from coal tar sealer vs. asphalt sealer in-use lots



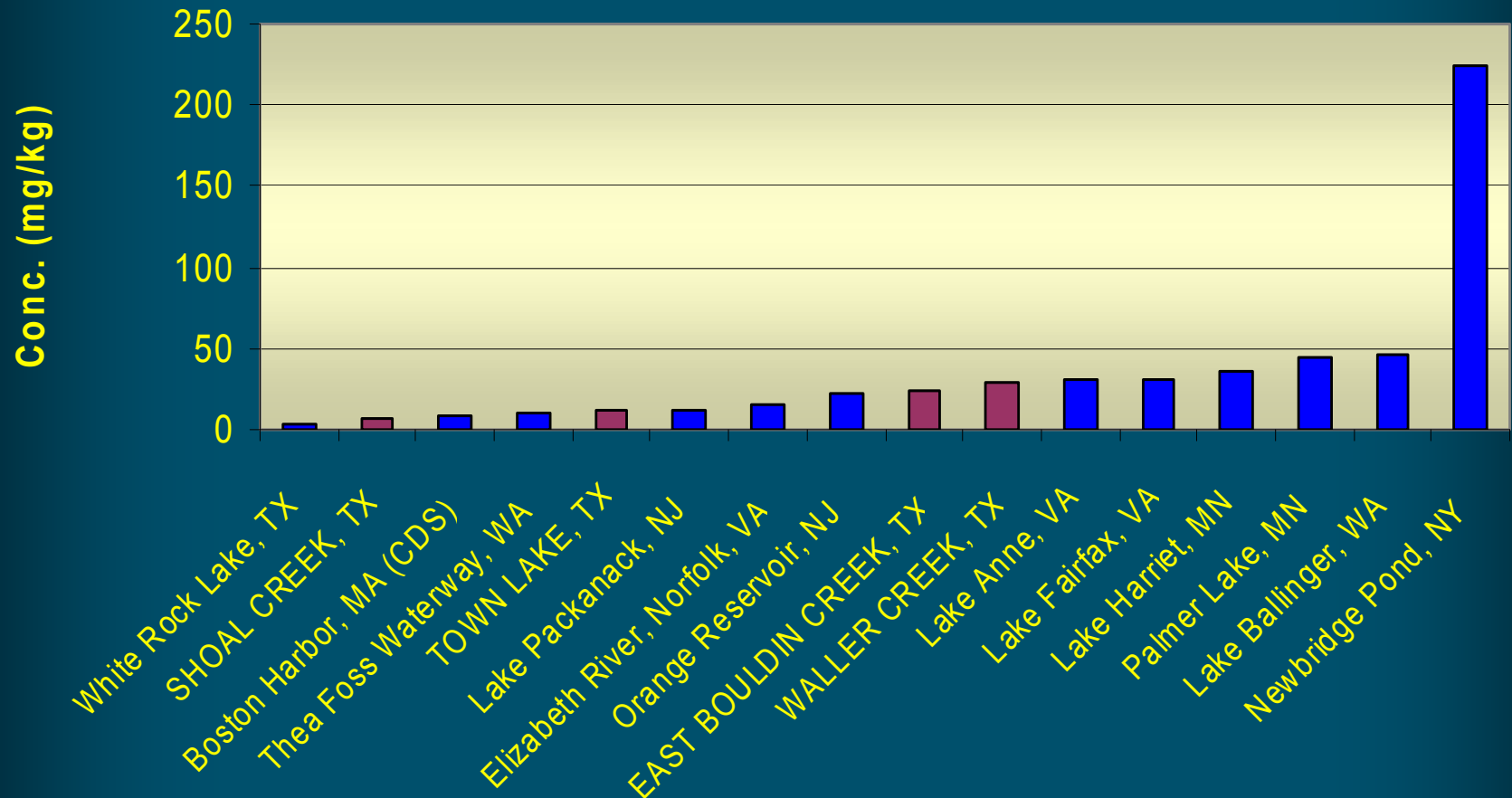
# Sources of PAH Contributions Equivalent to Rain Event on Freshly Sealed Residential Driveway (50m<sup>2</sup>)





# Austin Waterbody PAH Levels Not Extraordinary

**Sediment measurements typical** — sources: Van Metre et al., 2000. *ES&T* 34:4064; Geismer report. COA unpubl. results.





# Co-opting Science

- **USGS/City team documented the obvious:**
  - **coal tar constituents can be washed/scraped off coal tar-based pavement sealer**
  - **PAHs can be washed off in-use parking lots**
- **Demonstration NOT Investigation**
- **Exploiting credibility of USGS researchers recognized expertise**



# Austin Team Produces First Data Quality Act Challenge for USGS

VIA FEDERAL EXPRESS AND E-MAIL TO  
INFOQUAL@USGS.GOV

Geographic Information Office  
U.S. Geological Survey  
159 National Center  
Reston, VA 20192

Re: Complaint About Information Quality

Dear Sir or Madam:

Please find enclosed a complaint and request for correction pursuant to the provisions of the U.S. Geological Survey's Guidelines for Ensuring the Quality of Information Disseminated to the Public and the underlying federal statute commonly known as the Data Quality Act.



# Parking Lot Runoff Samples Collected by USGS (Mahler et al., 2004)

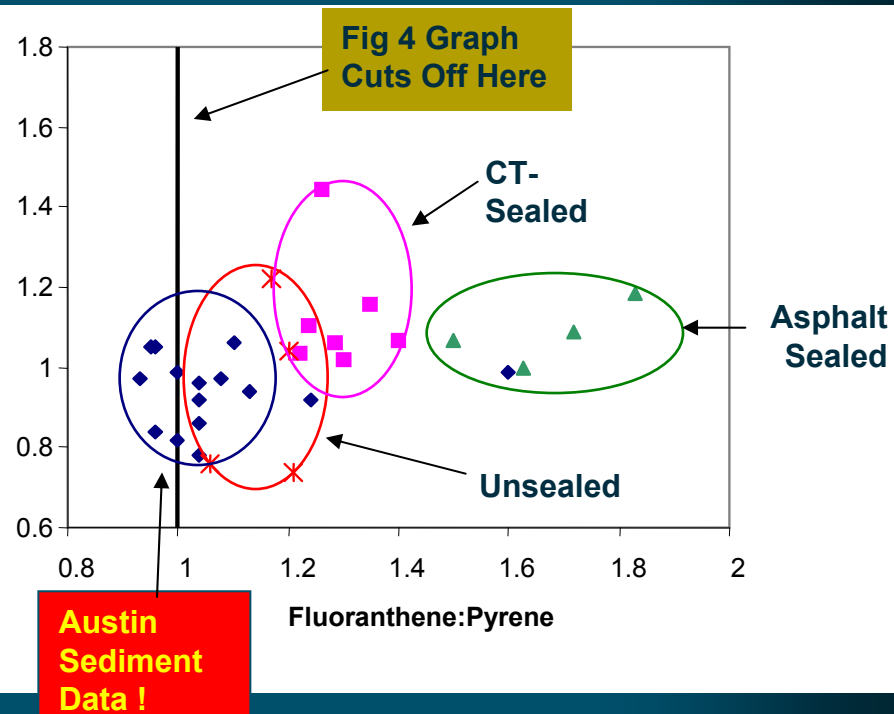
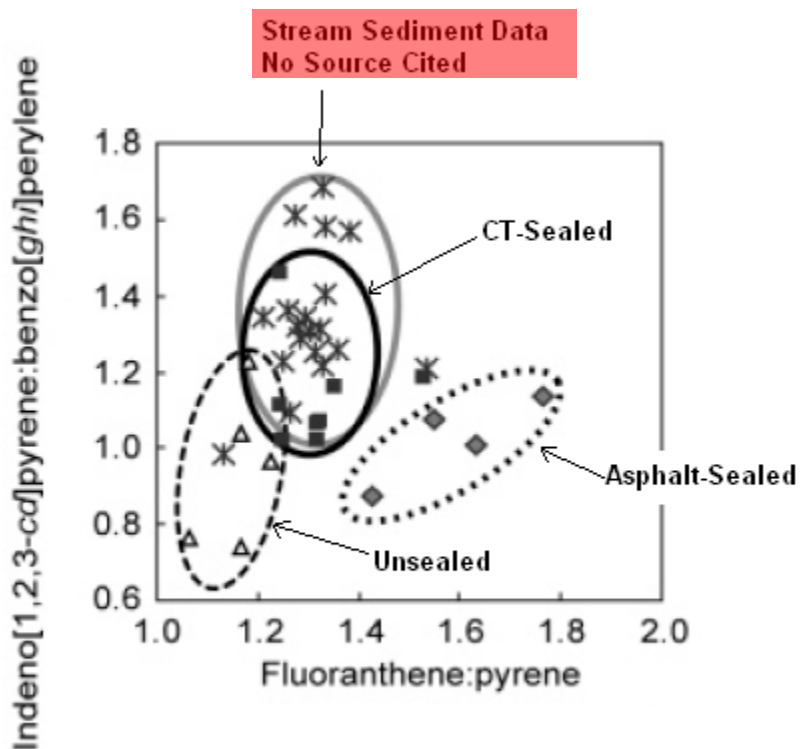
Sample ID	Description	Age of Sealcoat <sup>a</sup>
Mon-1	test plot	15 days
Mon-2	test plot	34 days
Mon-3	test plot	51 days
Tar-1	test plot	15 days
Tar-2	test plot	34 days
Tar-3	test plot	51 days
TCQ	in-use parking lot, sealed March 2003	6 mo.
LBJ	in-use parking lot, sealed July 2003	2 mo.
UTN	in-use parking lot, sealed July 2003	2.5 mo.
CNR	in-use parking lot sealed July 2003	2.5 mo.
OSL	in-use parking lot sealed July 1999	50 mo.
UNF-1	in-use parking lot sealed March 2000	34 mo.
UNF-2	duplicate	34 mo.

<sup>a</sup> Age at time of sampling

Source: Mahler et al., (2004) Concentrations of Polycyclic Aromatic Hydrocarbons (PAHs) and Major and Trace Elements in Simulated Rainfall Runoff from Parking Lots, Austin, Texas, 2003



# Selective Data Interpretation



ES&T Article – Figure 4

Re-Plot with Austin Sediments





# Motivating Action, Outcry

“It's pretty apparent that these sealants, particularly the coal tar sealants, are dumping a large portion, **probably the majority** of the PAHs that we see in the Austin area”

City Staffer M. Scoggins – News 8 report, 9 Nov 2005

- “Big Problem” implies big bang from ban
- Stated to City Council that ban would solve most of urban PAH issue



# Austin Ban

## Before And After Sediment Monitoring



# Stream Characteristics



- Semi-arid, intermittently dry streambed segments
- Pools and depositional areas limited
- Flash-flood type flows common



# Scoured Streambeds Key to “Snapshot” Study Design



• Shoal Creek, urban edge

• Waller Creek, near downtown

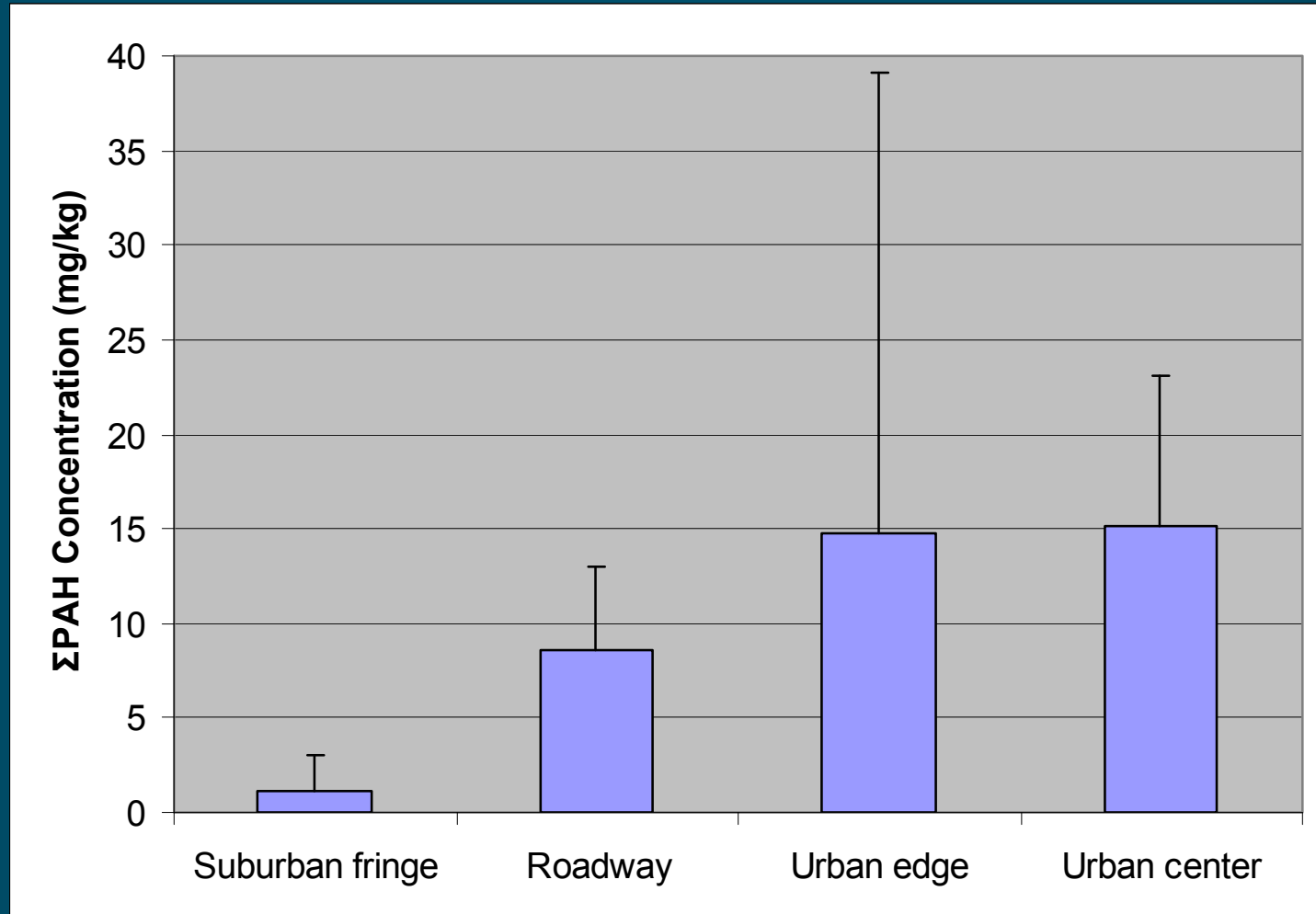


# Location Selection

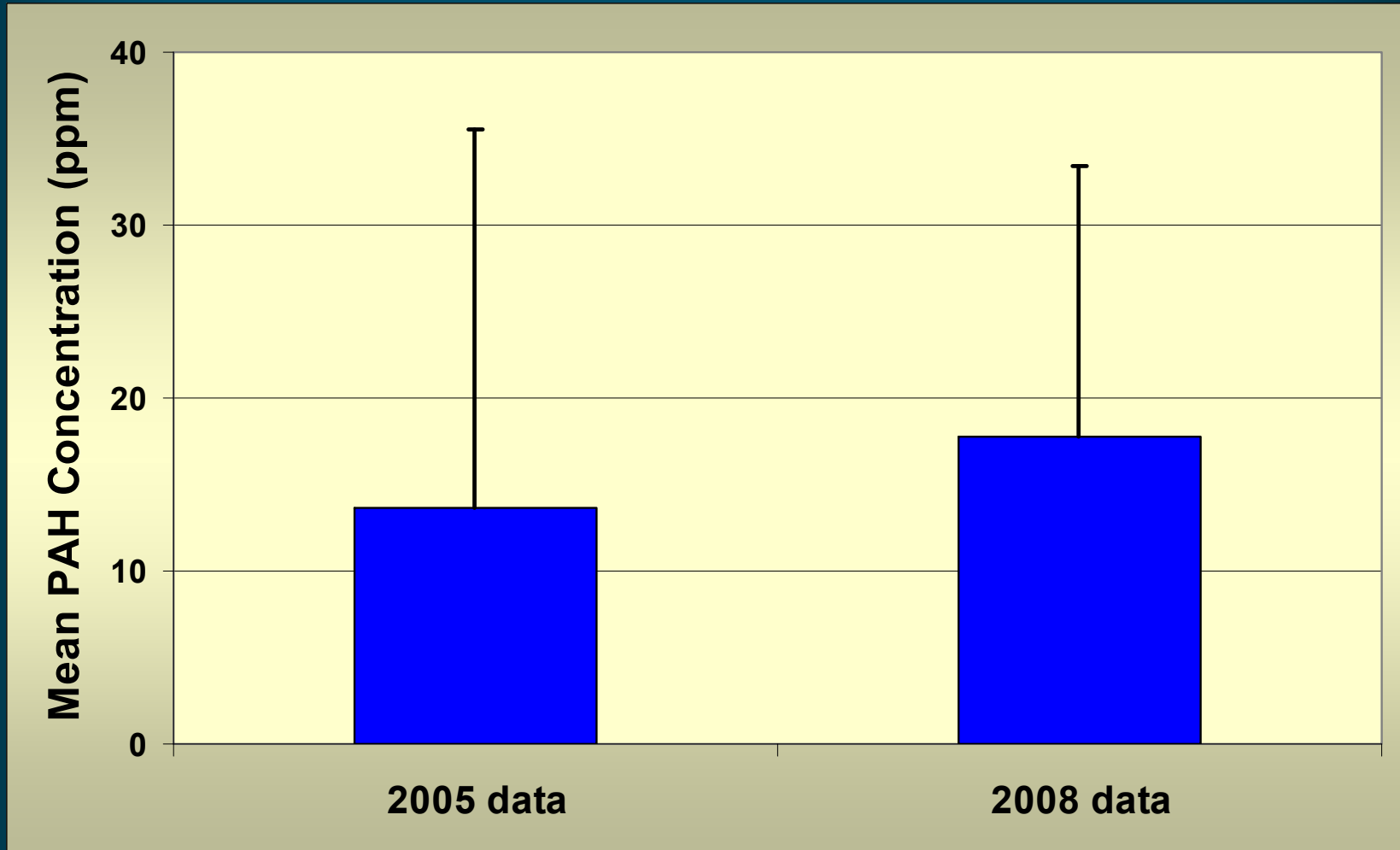
- **12 stream systems around Austin**
  - **16 stations**
  - **5 sampled before/after flushing rain event**
- **2 highway drainage swale stations**
- **2005 event prior to ban**
- **2008 event (28 mos. post-ban)**



# Highest PAH Concentrations Detected in Urban Areas

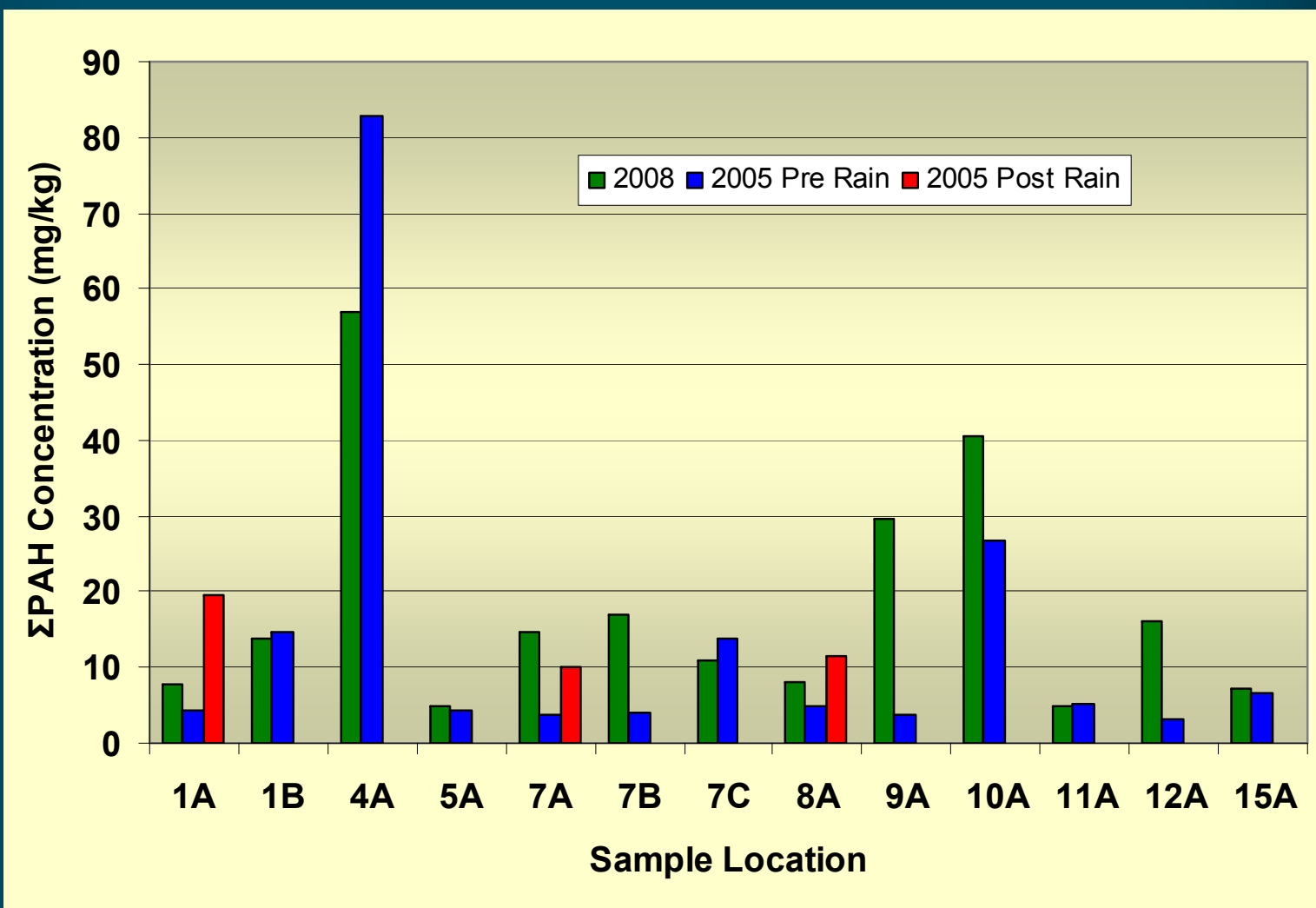


# Arithmetic Mean PAH Levels Detected in Sediments Sampled in 2005 (Pre-Ban) and 2008 (Post-Ban)





# Comparison of $\Sigma$ PAH Concentrations Detected in 2005 and 2008

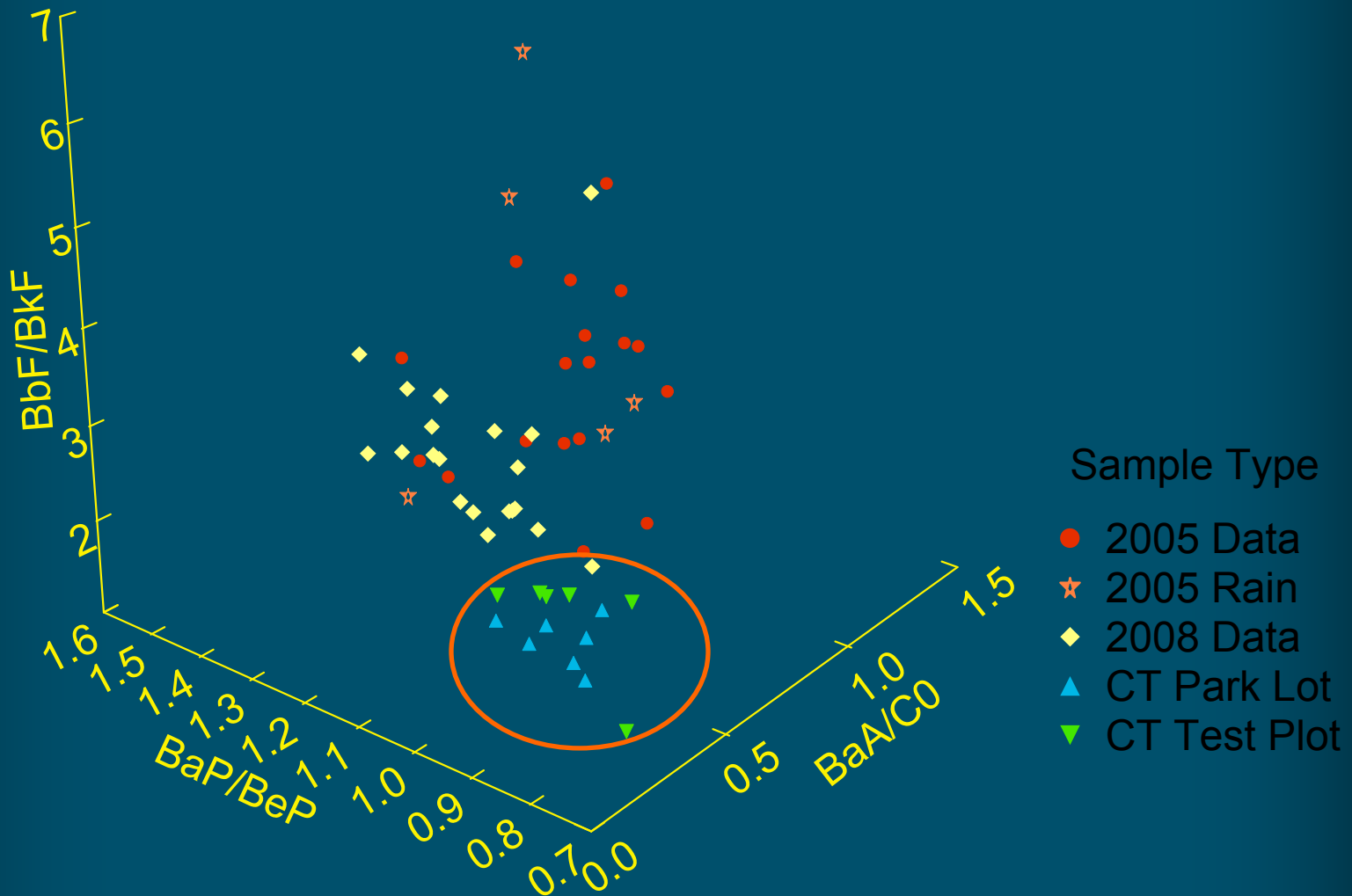


$\Sigma$ PAH Concentrations detected at 13 locations sampled in 2005 and in 2008





# PAH Fingerprinting Shows Austin Sediments Do Not Match Coal Tar Signature





# Conclusions

- No change in PAH concentrations two years following coal tar sealer ban
- PAH fingerprinting shows distinct differences between:
  - coal tar-sealed parking lot washoff
  - Austin stream sediments
- Interval between rain events affect PAH concentrations in Austin sediments





# Austin Fever

- Formula for being an environmental hero is laid out
  - Story is easily “sold”
  - Victim is not very sympathetic
- “Discovery” has drawn students and research funds – “let me repeat that in my town...”
- Maryland, Minnesota, Springfield MO



# Sealer Product Vulnerabilities

- High PAH Concentration (coal tar)
- Readily accepted as “problem”
  - Highly visible
  - Sticky and smelly
- Perception -- easy to address / regulate
- Will emphasize wear, ravelling