Contaminant Trends in Urban and Reference Lake Sediments Across the United States, 1970 to 2001
Is the Nation’s Water Quality Getting Better or Worse?
Washington-Baltimore urban sprawl
Contaminants in Streams

**Soluble**
- PESTICIDES
  - Atrazine
  - Diazinon
  - 2,4-D
- SOLVENTS
  - TCE
  - DCE
- FUELS
  - Benzene
  - Toluene
  - Xylene
- NUTRIENTS
  - Nitrate
  - Phosphorous

**Insoluble**
- METALS
  - Cadmium
  - Mercury
  - Lead
- PESTICIDES
  - DDT
  - Chlordane
  - Dieldrin
- PCBs
- PAHs
  - Fluoranthene
  - Pyrene
  - Benzo(a)pyrene
- OTHER…
If it’s **hydrophobic** and persistent…

We can see trends in sediment cores
Why not use historical water-quality data?

Lead in the Trinity River Basin, Texas
Lakes Sampled from 1996-2001

33 urban lakes, 9 reference lakes

Organics – Van Metre and Mahler, ES&T, 2005
Metals – Mahler et al., ET&C, in press
Testing Trends

![WRL Core Downward trend 1970 DDT Use](image)

- Total DDT (ppb)
- 0 50 100
- 1900 1920 1940 1960 1980 2000
- 0 50 100
- 1900 1920 1940 1960 1980

Downward trend 1970

DDT Use

WRL Core

Testing Trends

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Downward trend 1970

DDT Use

WRL Core
Metals trends

Percentage of lakes with trend

Upward
No trend
Downward

Cr  Pb  Ni  Cd  Hg  Cu  Zn
Lead

- Orlando, FL: dense urban
- Austin, TX: light urban
- Rocky Mountains, CO: reference

Map shows increasing, no, and decreasing trends across the USA.
Mercury

Hobbs Lk, Wind Rivers, WY

Lk Elbert, Zirkels, CO
Organic Compounds

- Benzo(a)pyrene

Bar charts showing the percentage of lakes with trends for organochlorine compounds and polycyclic aromatic hydrocarbons. The compounds are listed on the x-axis, and the y-axis represents the percentage of lakes with trends (increasing, no trend, insufficient detections, decreasing). The charts indicate trends for different compounds such as chlorodane, DDE, PCB, and others.
Two directions of change

**ΣDDT**

- dense urban (Seattle)
- reference (Orlando, FL)
- light urban (Chicago)

**ΣPAH**

- dense urban (Seattle)
- light urban (Chicago)
- reference (Orlando, FL)
You're standing on it!
Parking lot sealcoat and urban PAHs

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Effects of urbanization on water quality II,
Tuesday, 3:35pm, Rm A2
Is the Nation’s Water Quality Getting Better or Worse?
On average, **better** in these 36 lakes