

USGS Urban Waters Portal

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River Rally Charleston, SC

June 4, 2011

Great Falls of the Potomac
River near Washington, D.C.

Goals of this Presentation

- Urbanization and Water Quality Trends
- Major Stories on Contaminants and Biota
- Scientific and Educational Tools for Watershed Organizations
- USGS Urban Waters Portal

Urbanization

New York City 1609

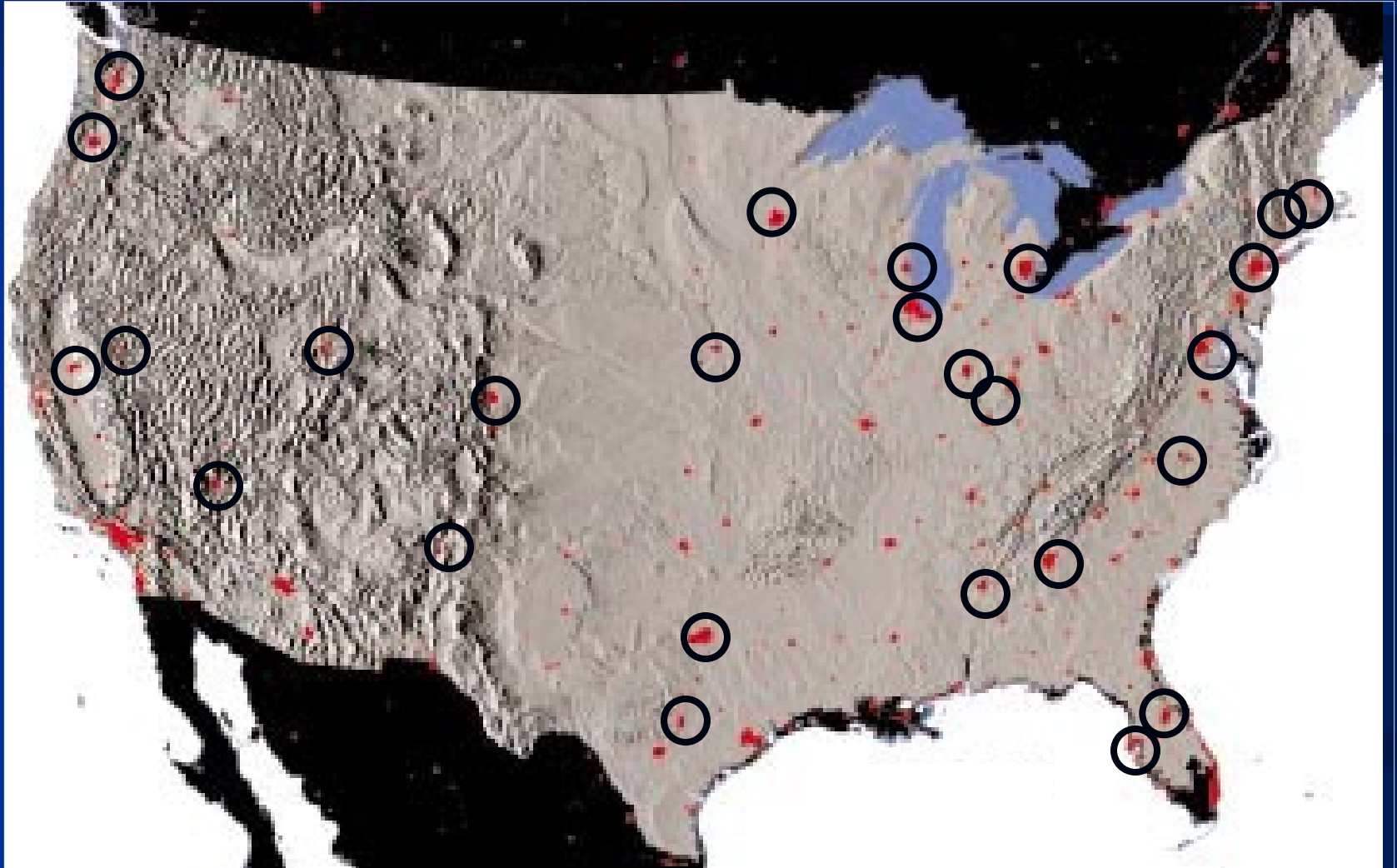


New York City 2009

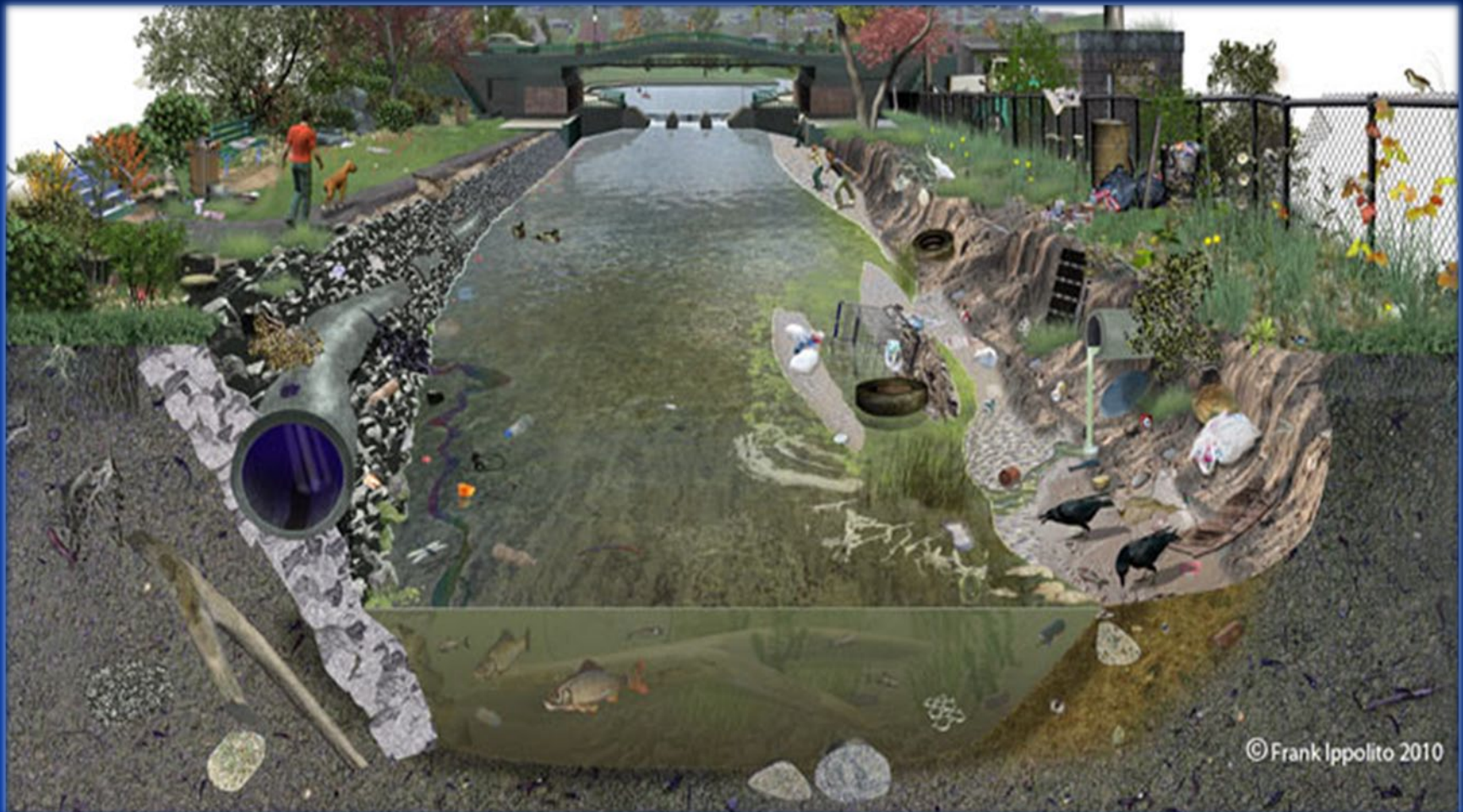


National Geographic Society, September 2009 Issue

USGS has investigated urban water quality across the Nation

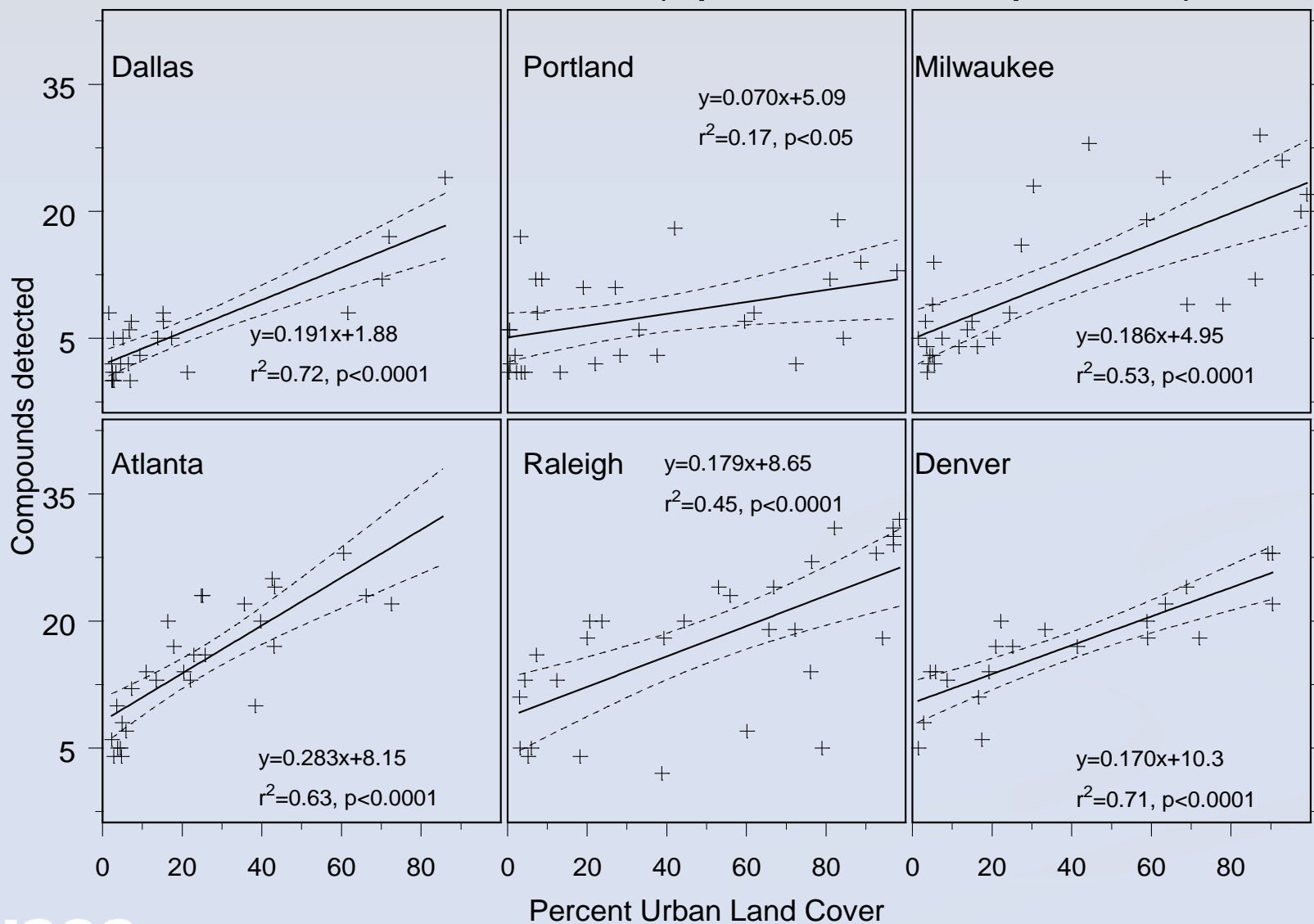


Problems for Urban Streams

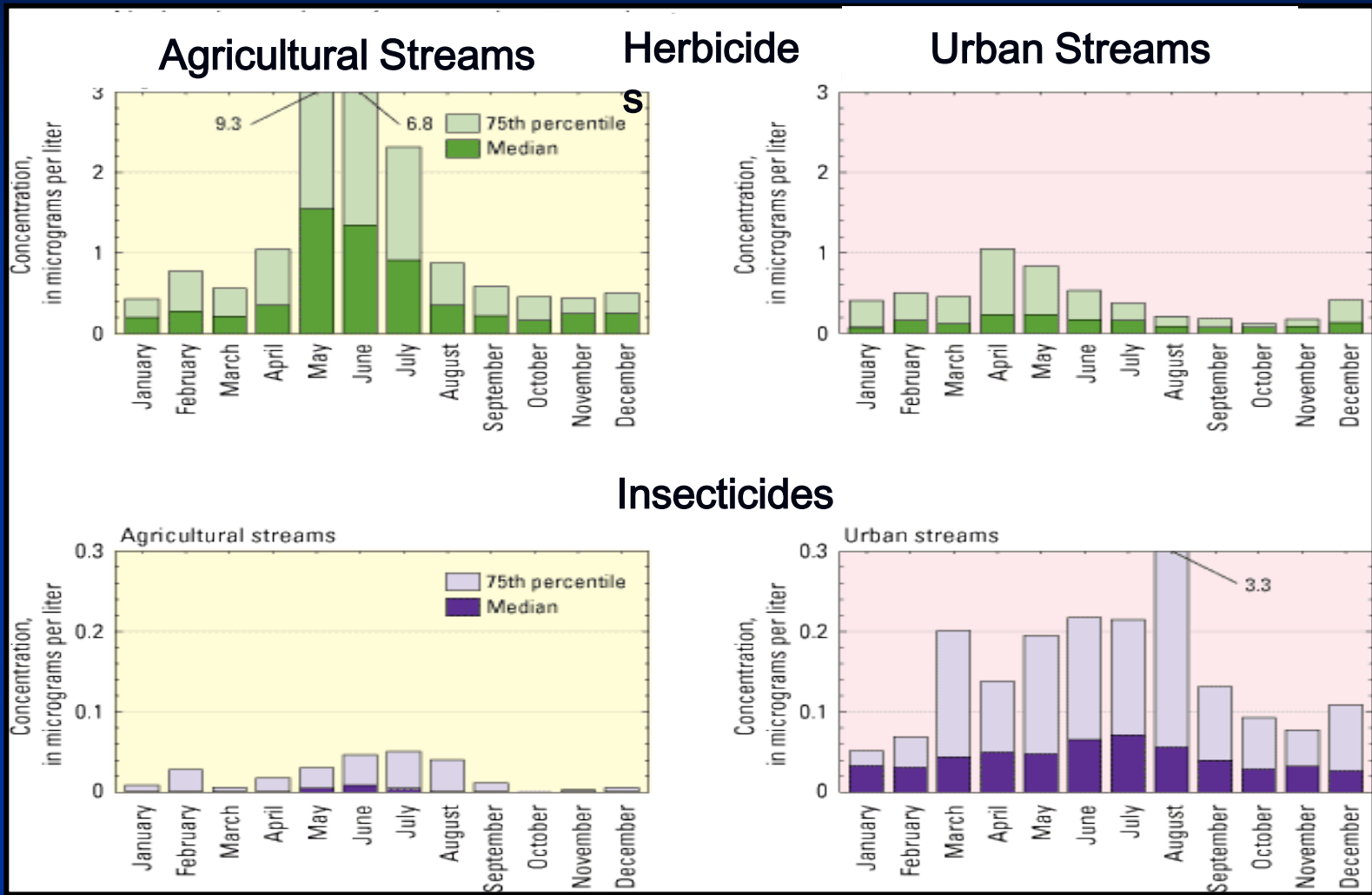


Stormwater Contaminants, Litter, Altered Hydrology

The number of chemical compounds detected was related to urban land cover (up to 140 Compounds)



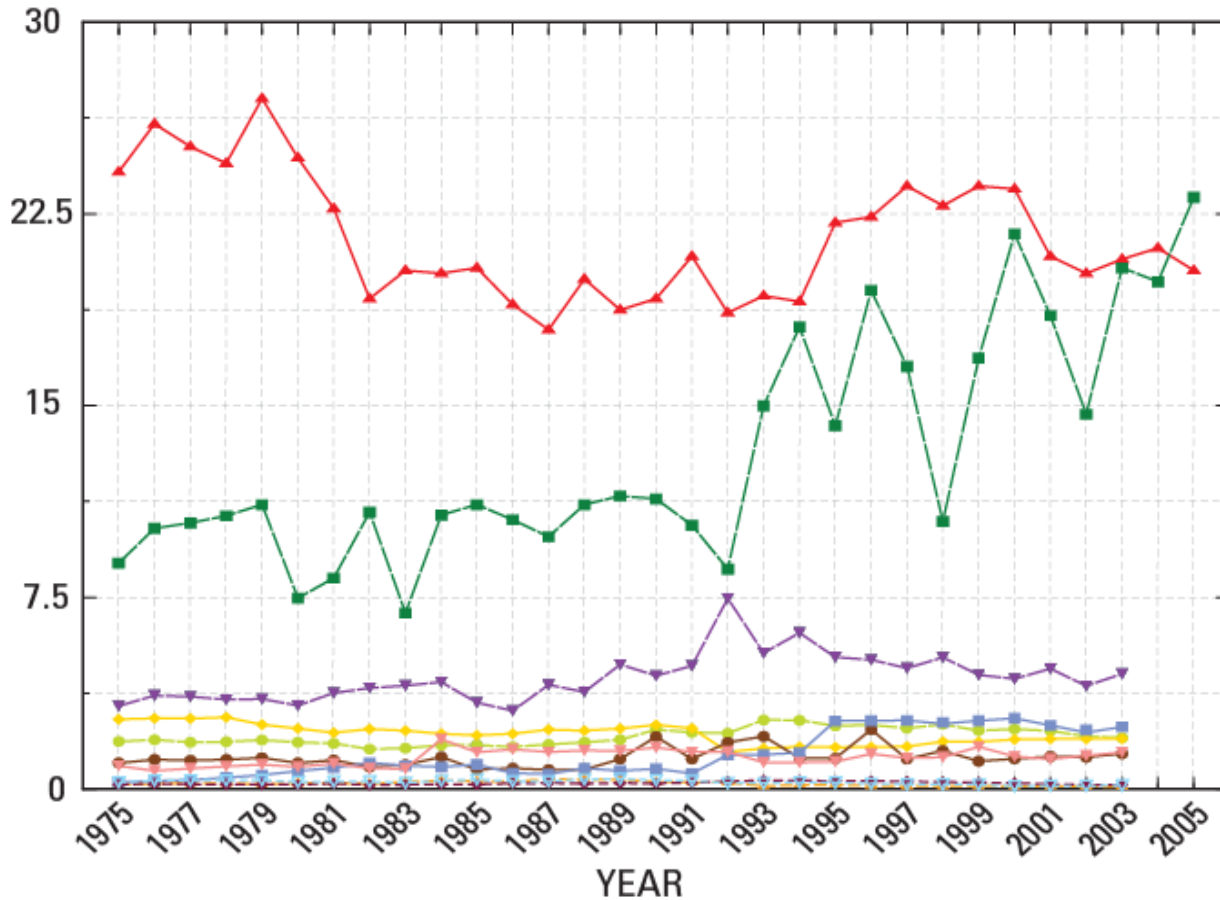
PESTICIDE CONCENTRATIONS FOLLOW SEASONAL AND LAND USE PATTERNS



Salt Consumption or Use

END USE OF SALT IN MILLIONS OF TONS

CONSUMPTION BY USE OR INDUSTRY

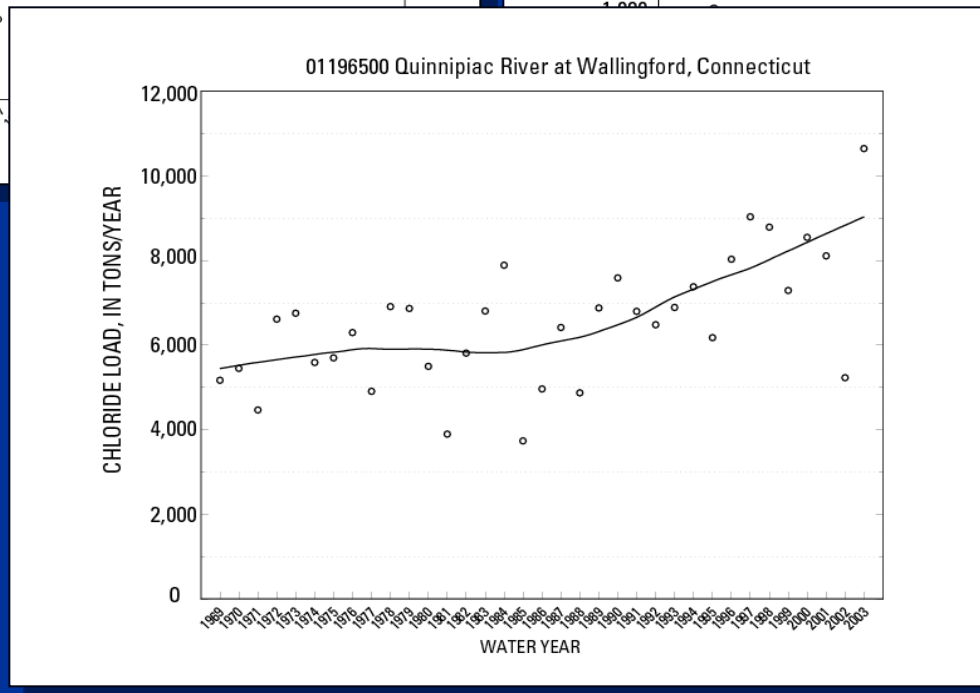
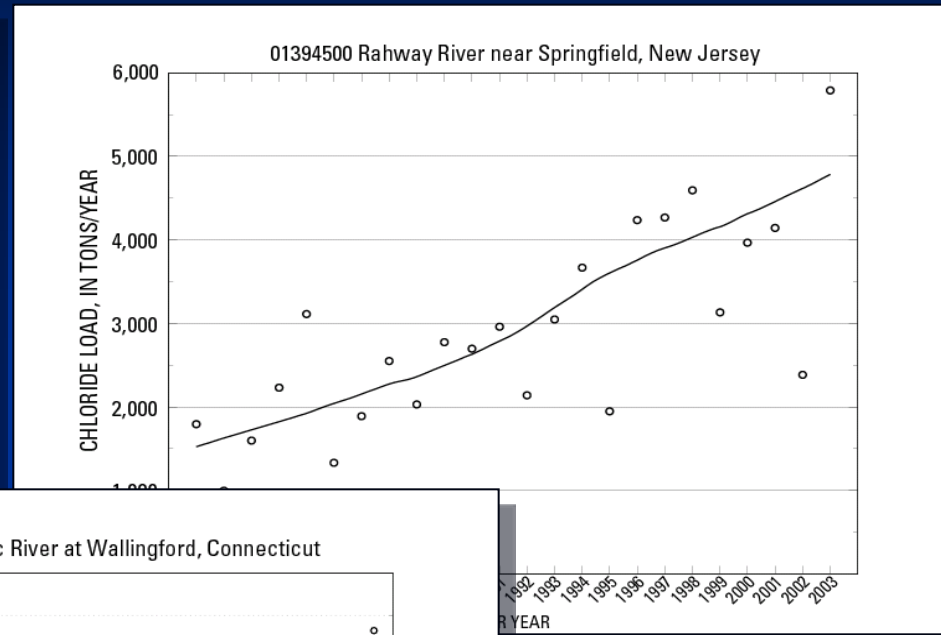
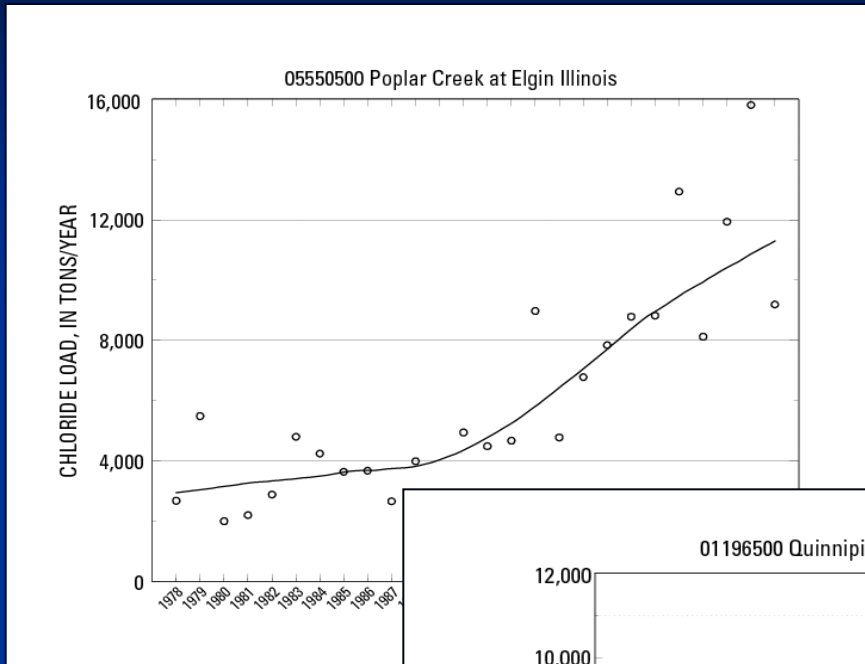


EXPLANATION

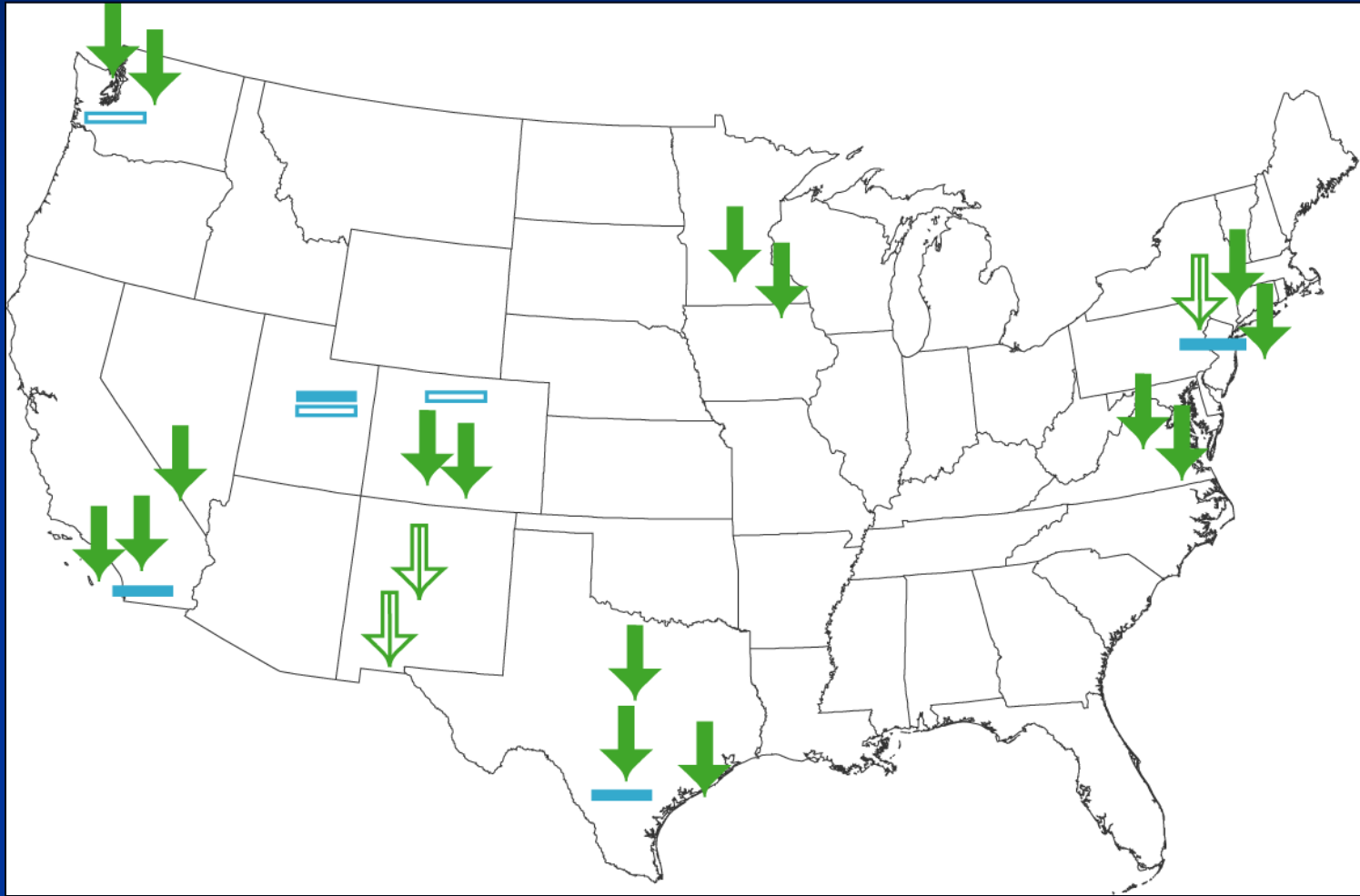
- Agriculture
- ▲— Alkalies and chlorine
- Deicing
- ◆— Food products
- ◇— Metal production
- Other chemicals
- ▲— Paper products
- Petroleum
- ◆— Textiles and dyeing
- ◇— Water treatment
- Other uses

Source: USGS Mineral Commodity Assessment

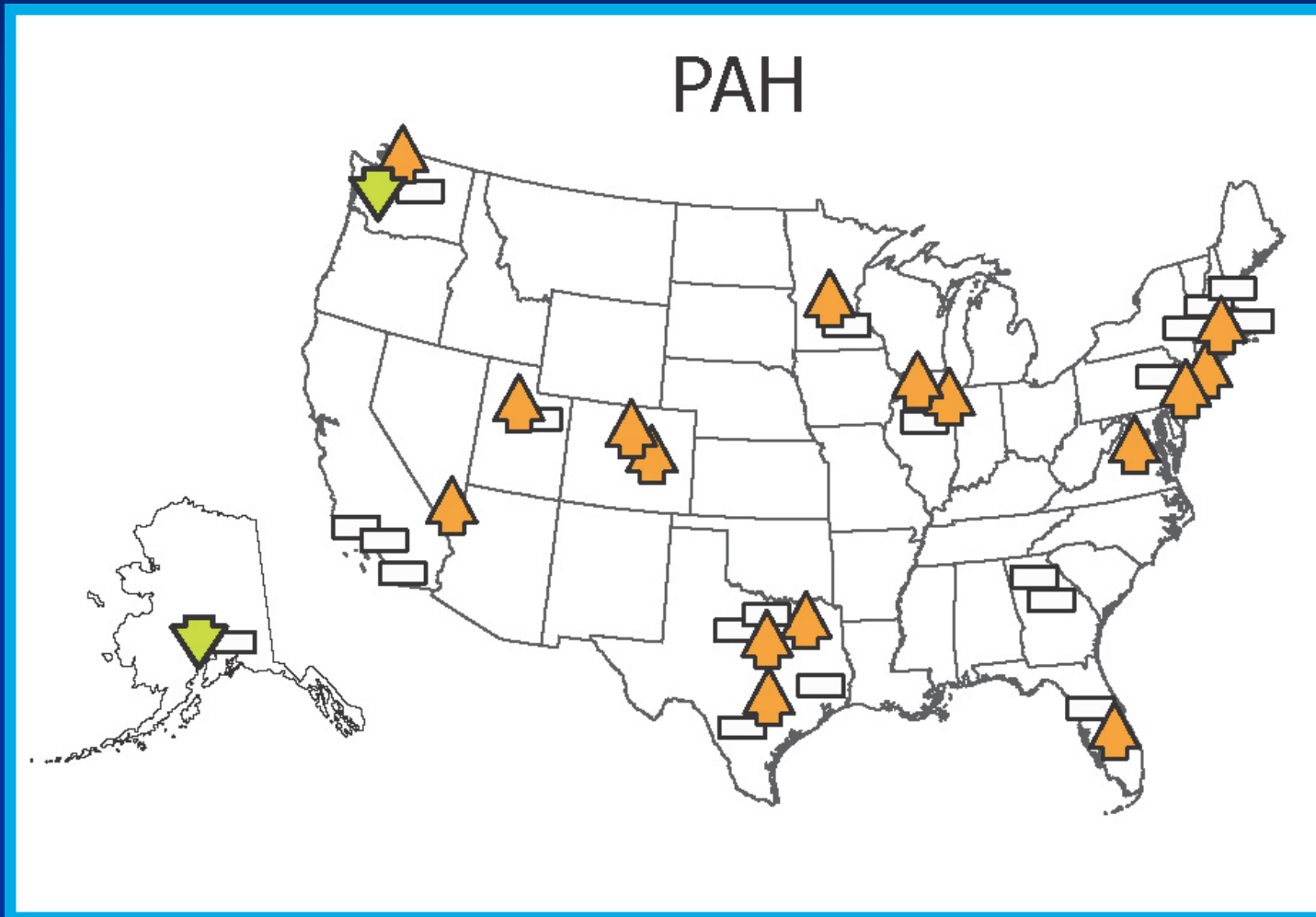
Trends in Chloride in Streams (1978-2003)



Lead Trends in Lake Sediment Cores 1965 to Present



PAH (hydrocarbon) Trends in Lake Sediment Cores, 1970 to 2001

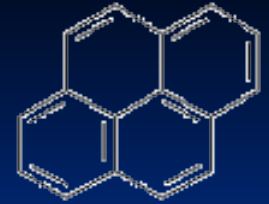


PAHs Sources?

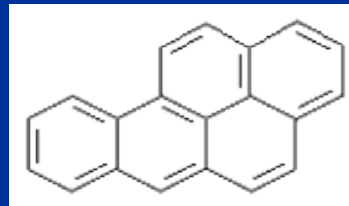
(polycyclic aromatic hydrocarbons)

- ❑ Produced by combustion of fossil fuels
- ❑ Many are carcinogenic, toxic, and mutagenic
- ❑ Urban sources:
 - ❑ Used motor oil
 - ❑ Exhaust
 - ❑ Industrial emissions
 - ❑ Asphalt
 - ❑ Coal tar
 - ❑ Tires

❑ **Sealcoat**



Pyrene



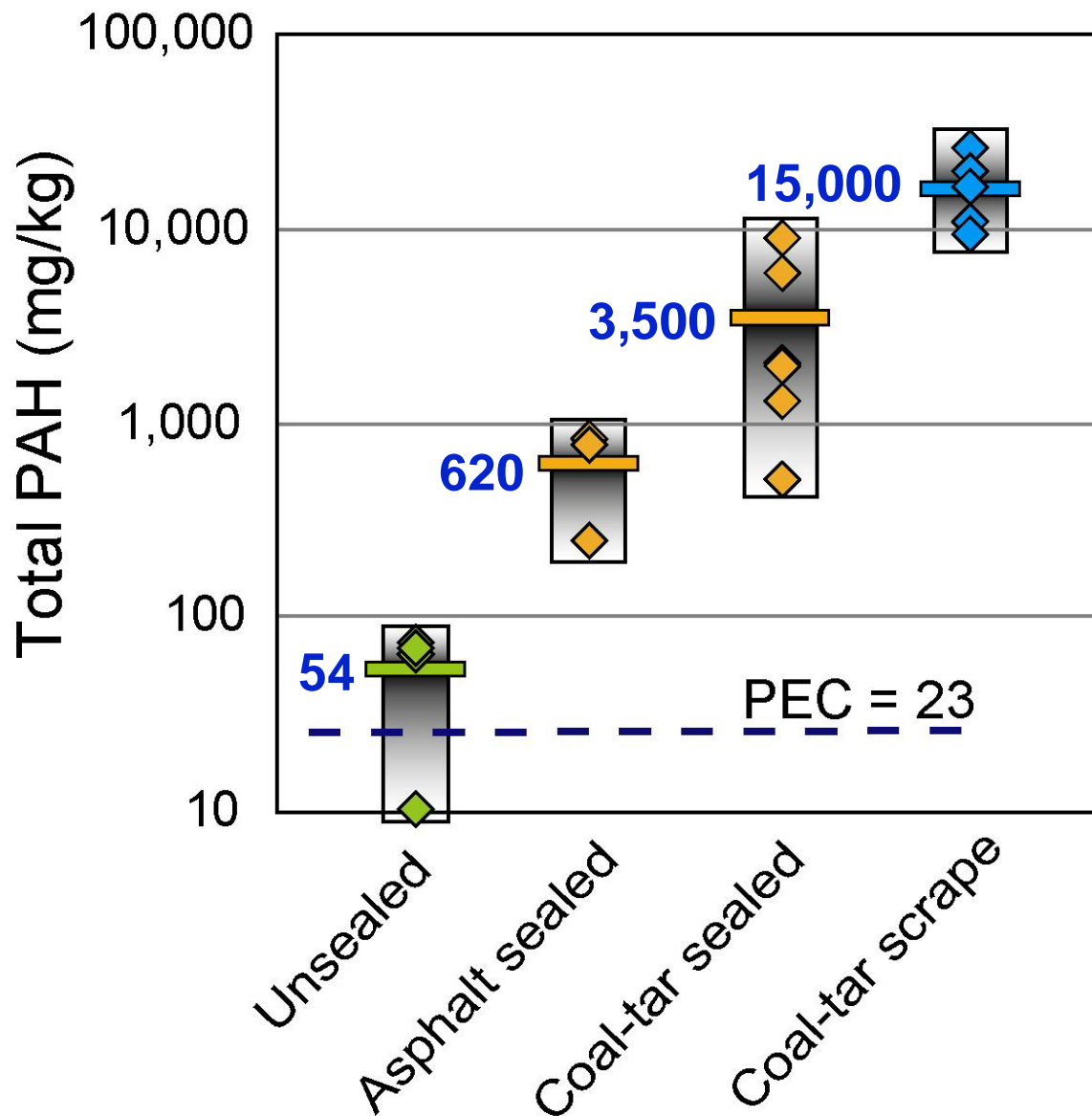
Benzo (a) pyrene



Refined Coal Tar Sealcoat



PAHs in Parking Lot Runoff



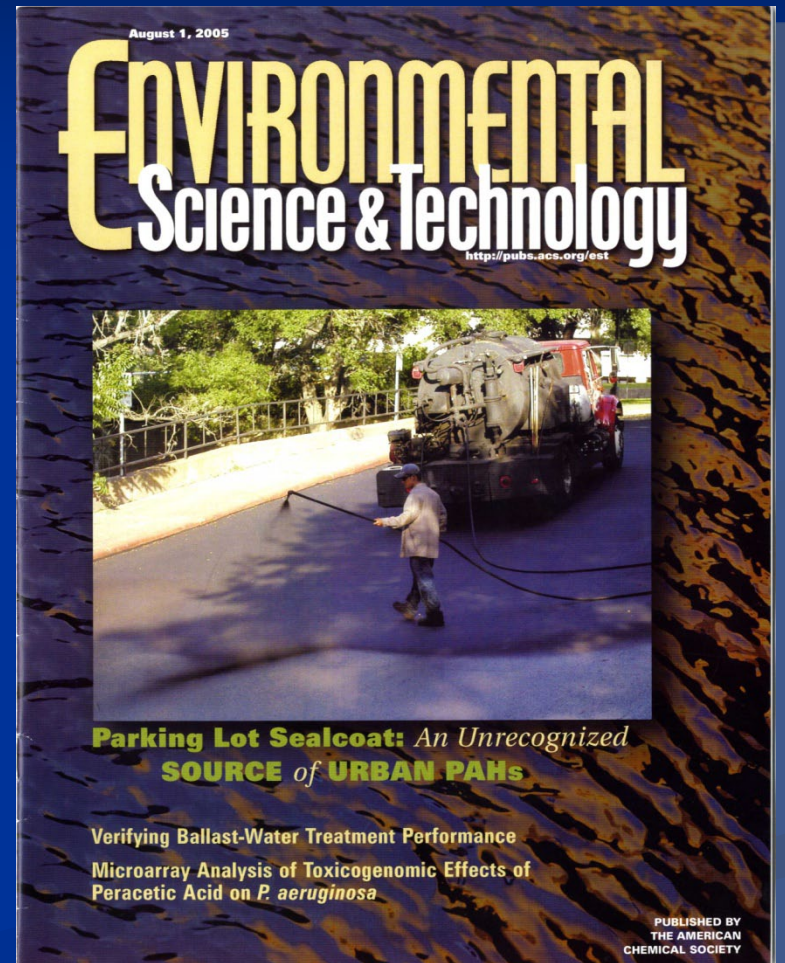
← Used Oil
600 mg/kg

← Tires
80-200 mg/kg

←

Policy Relevance

- Austin, TX, Dane County, WI, Washington D.C., State of Washington, and several small municipalities ban CT sealcoat (2006-11)



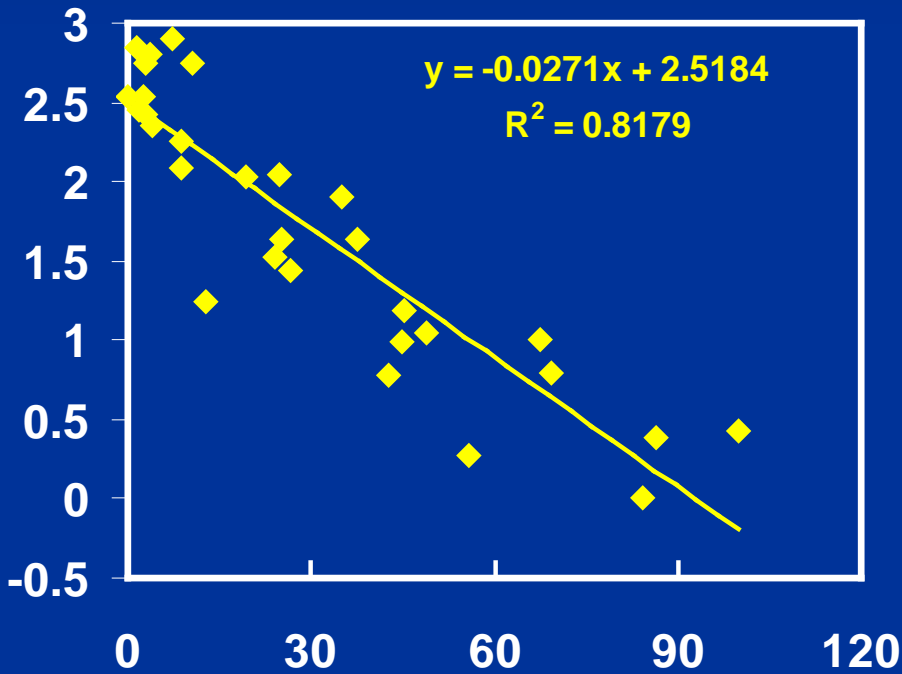
How do stream ecosystems respond to urbanization?



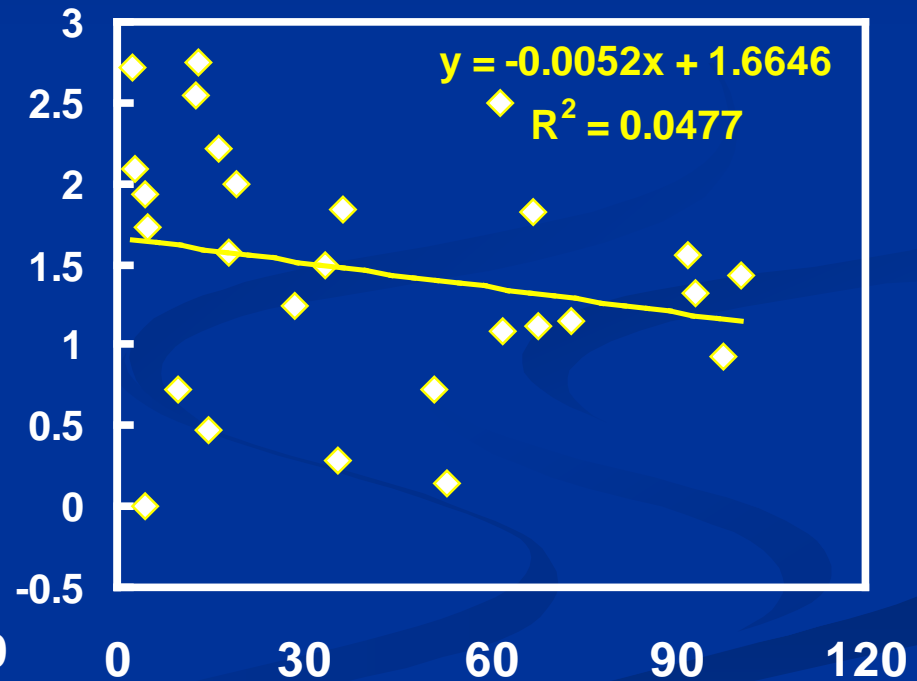
The effects of urbanization vary by City, but why?

Index of Pollution Sensitive Aquatic Insects

BOSTON

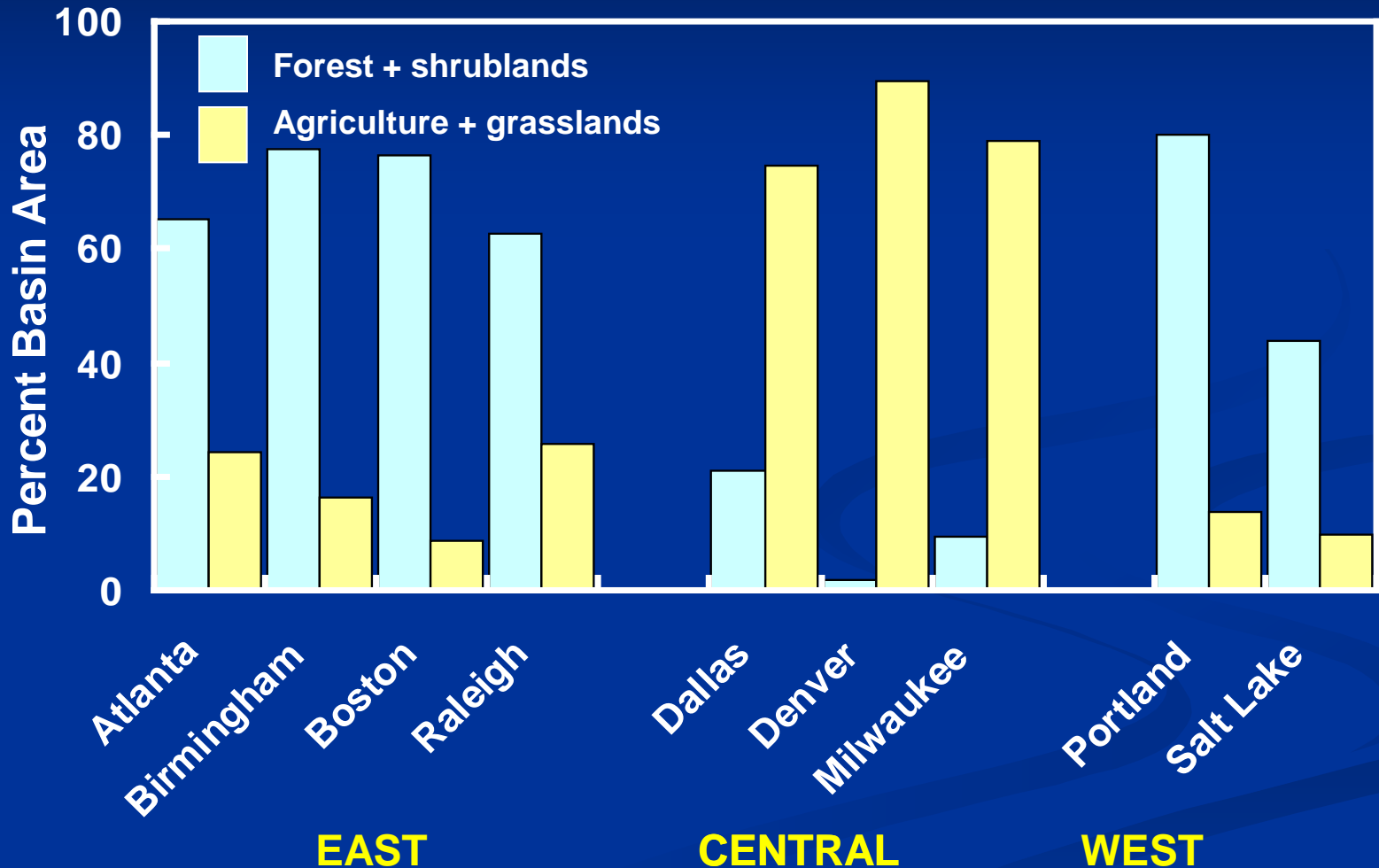


DENVER



URBAN INTENSITY INDEX

Previous land cover sets the baseline for the effects of urbanization on aquatic organisms



USGS Urban Waters Portal



Urban Water-Quality Issues Addressed through Multiple Studies

"Stream protection and management is a top priority of state and local officials, ...," said Tom Schueler, Chesapeake Bay Storm Water Network coordinator. "The USGS information has been useful in helping us to predict and manage the future impacts of urban development on streams and reinforces the importance of having green infrastructure to control storm water runoff and protect aquatic life."

<http://co.water.usgs.gov/nawqa/urbanPortal/index.html>