

# 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

- n Urbanization and Water Quality Trends
- n Major Stories on Contaminants and Biota
- n Scientific and Educational Tools for Watershed Organizations
- n 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



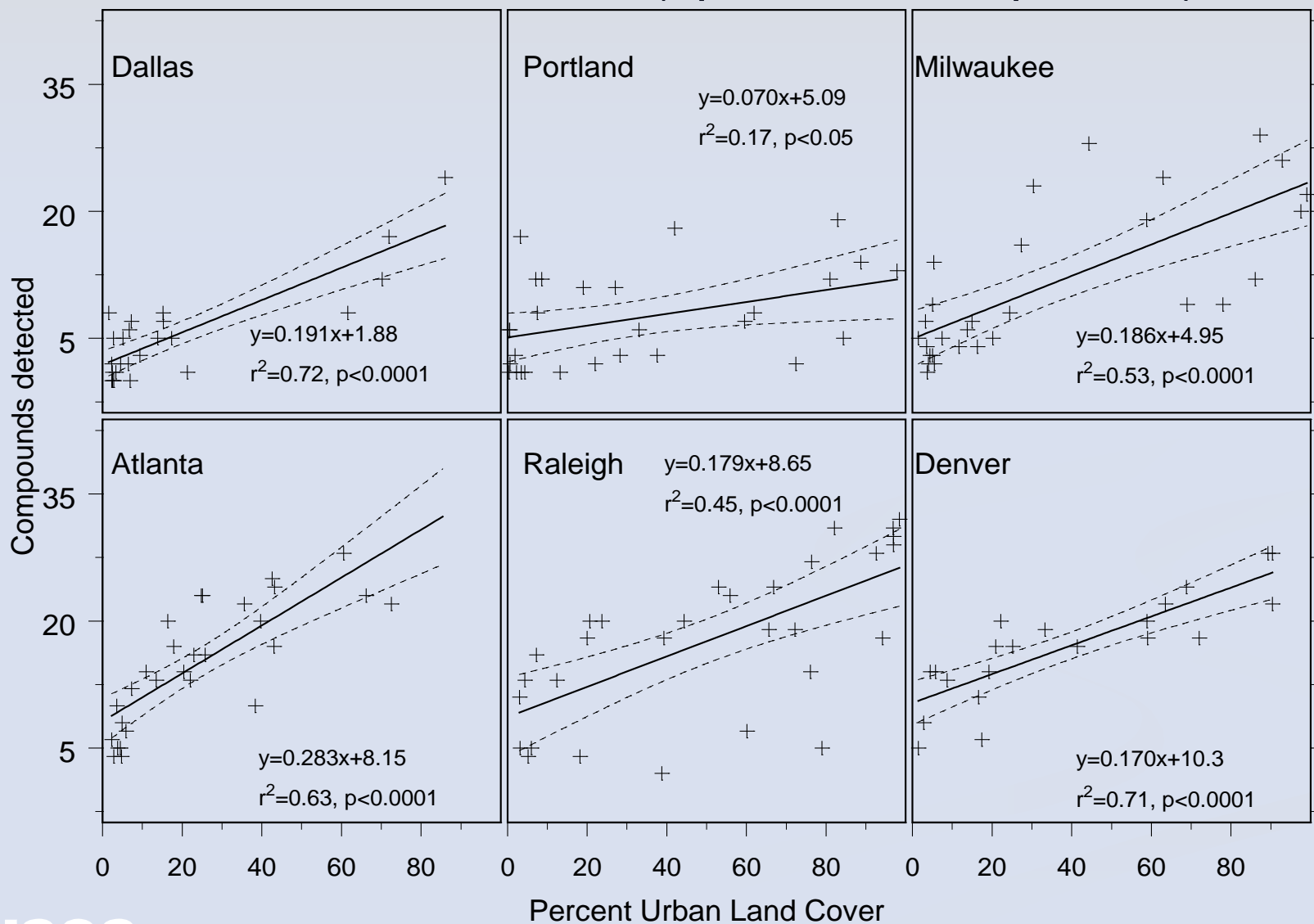


# Problems for Urban Streams

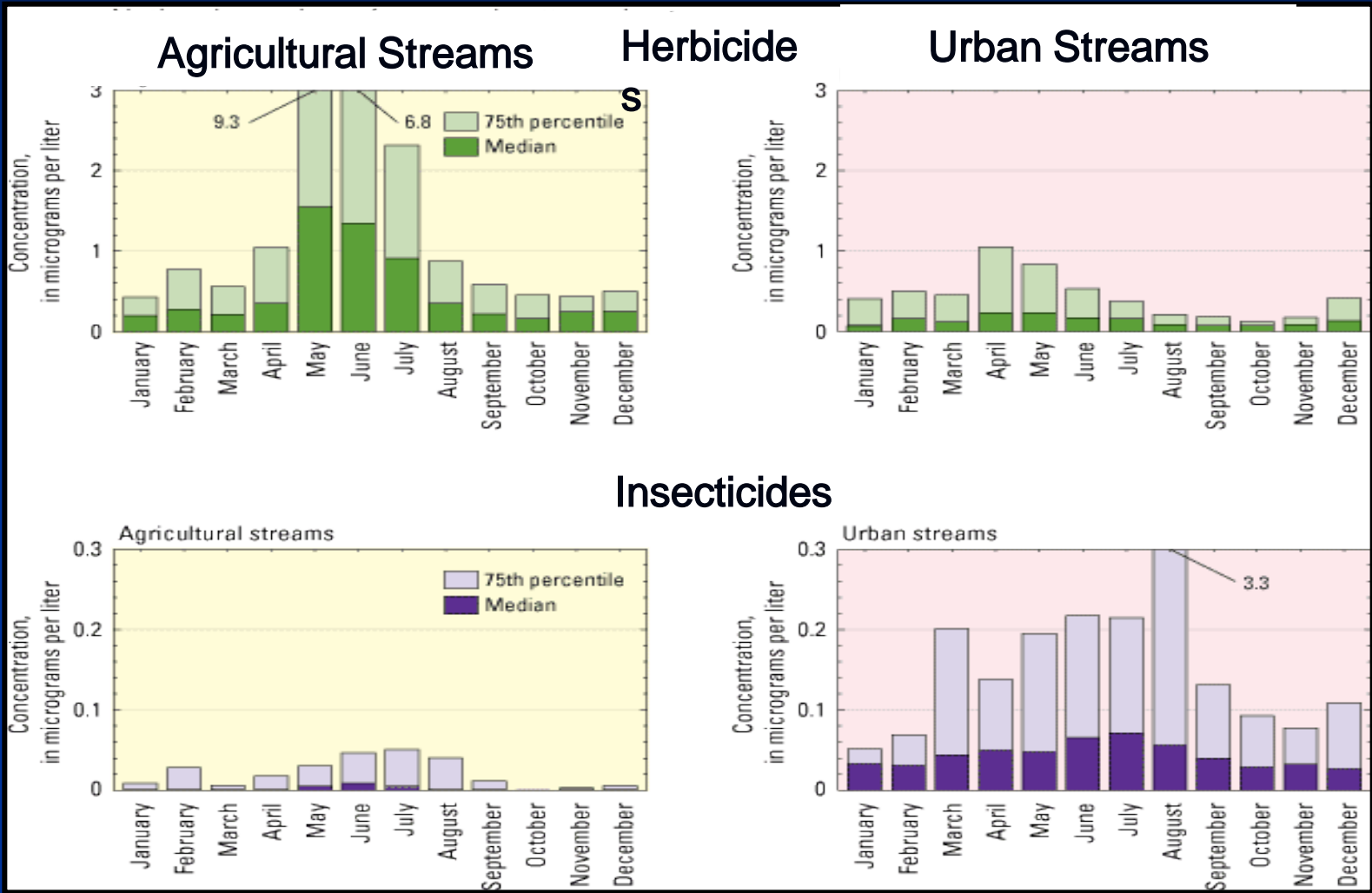


Stormwater Contaminants, Litter, Altered Hydrology

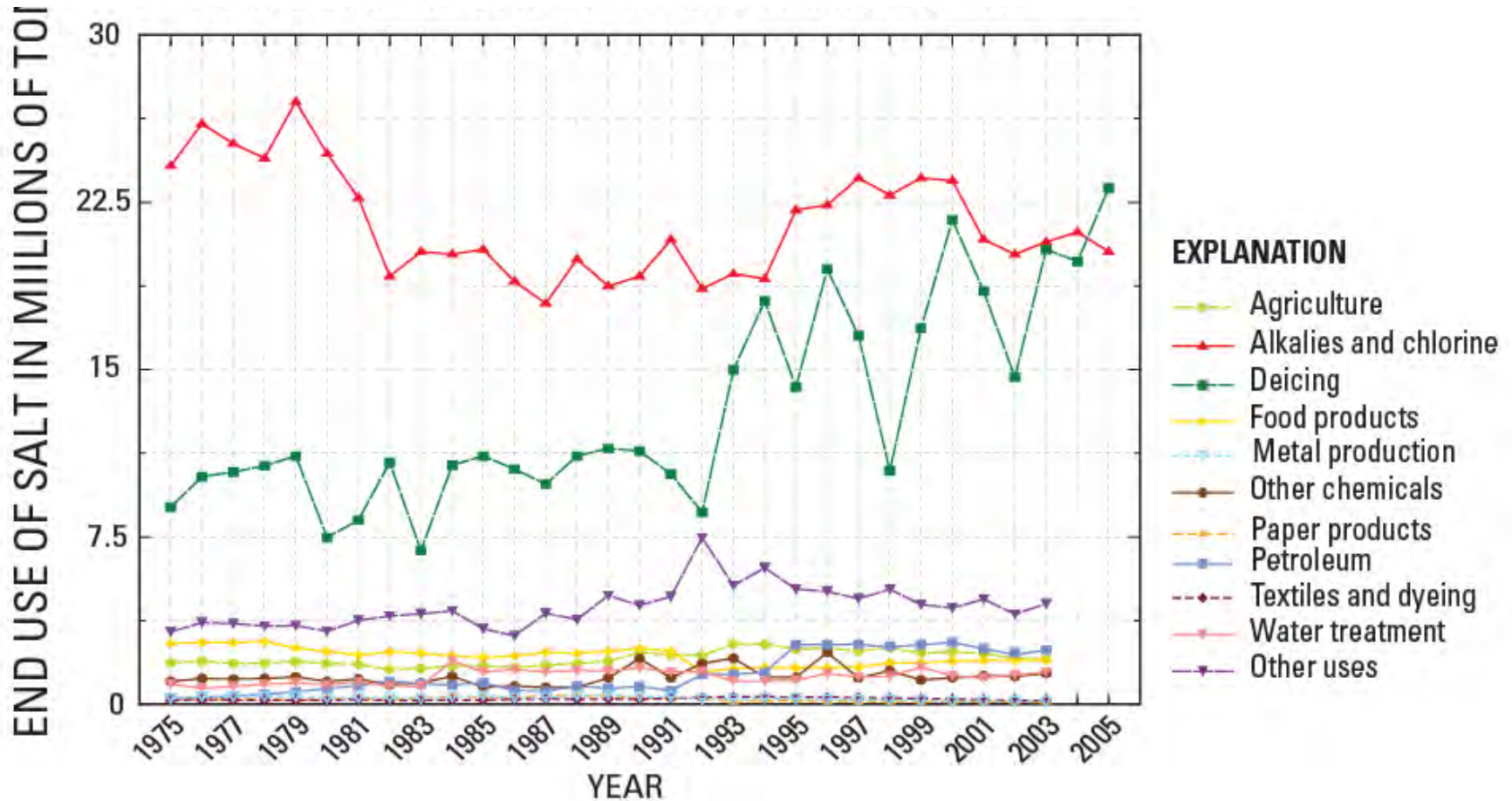
# The number of chemical compounds detected was related to urban land cover (up to 140 Compounds)



# PESTICIDE CONCENTRATIONS FOLLOW SEASONAL AND LAND USE PATTERNS



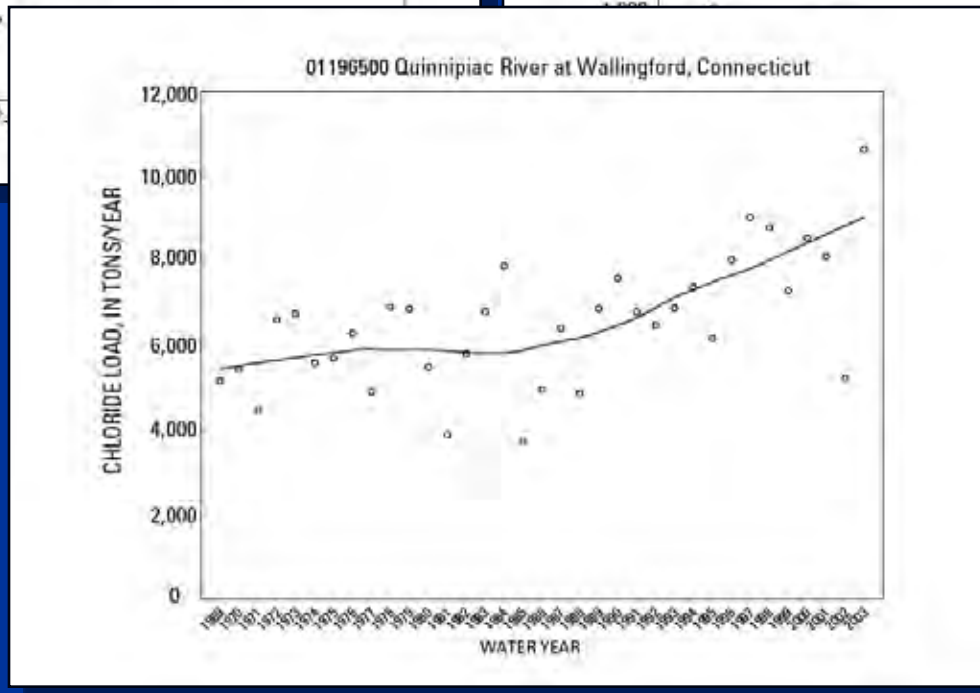
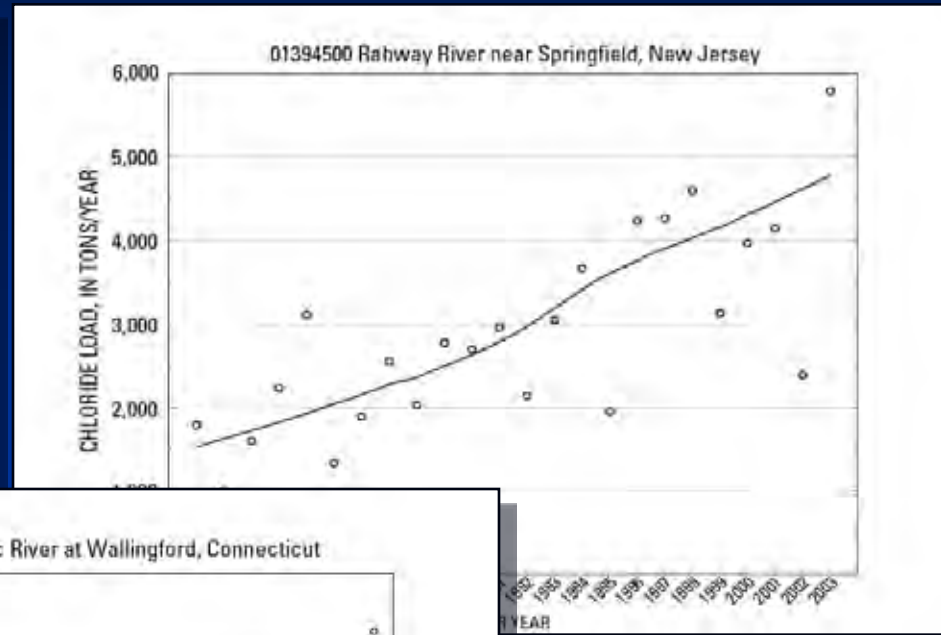
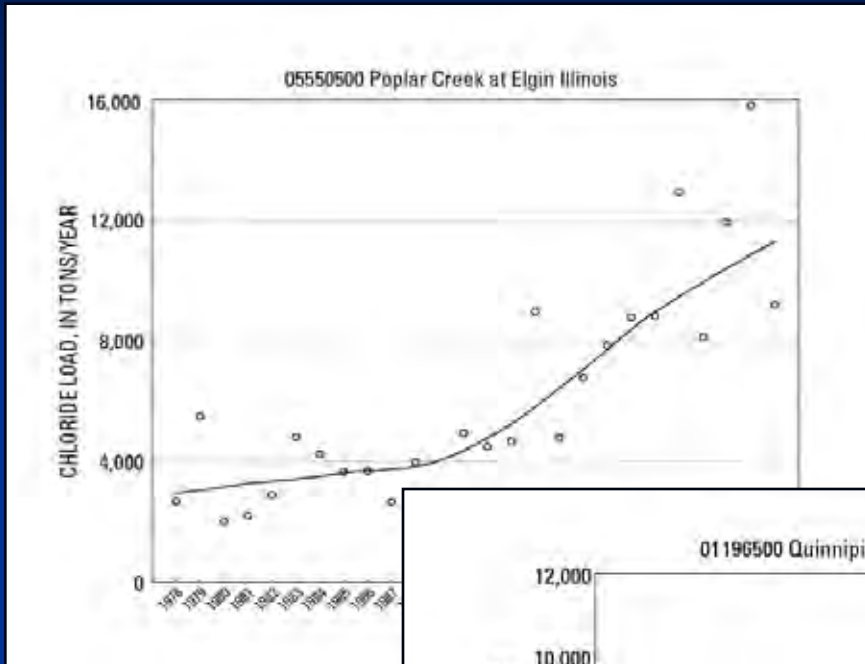
# Salt Consumption or Use



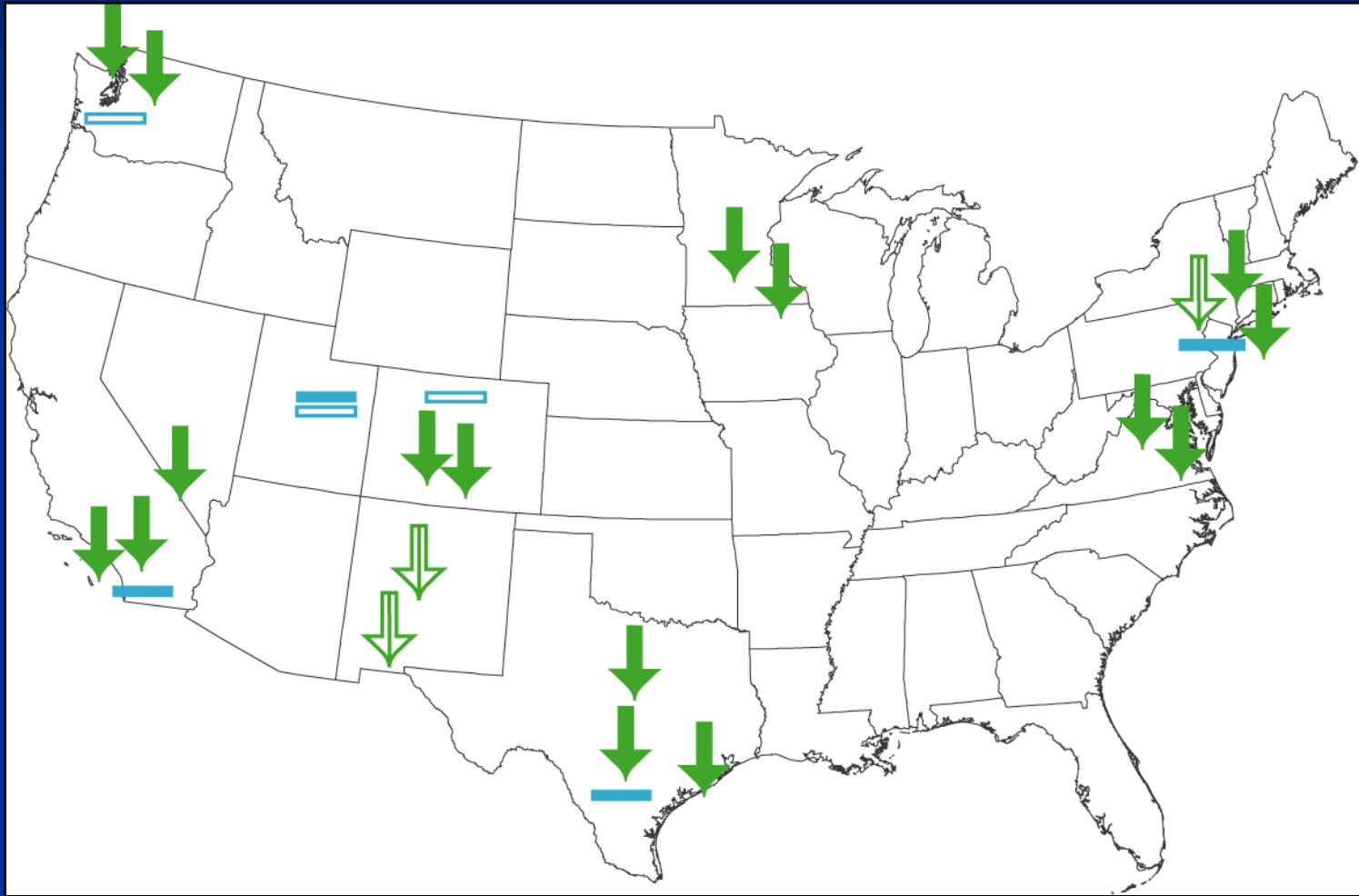
Source: USGS Mineral Commodity Assessment



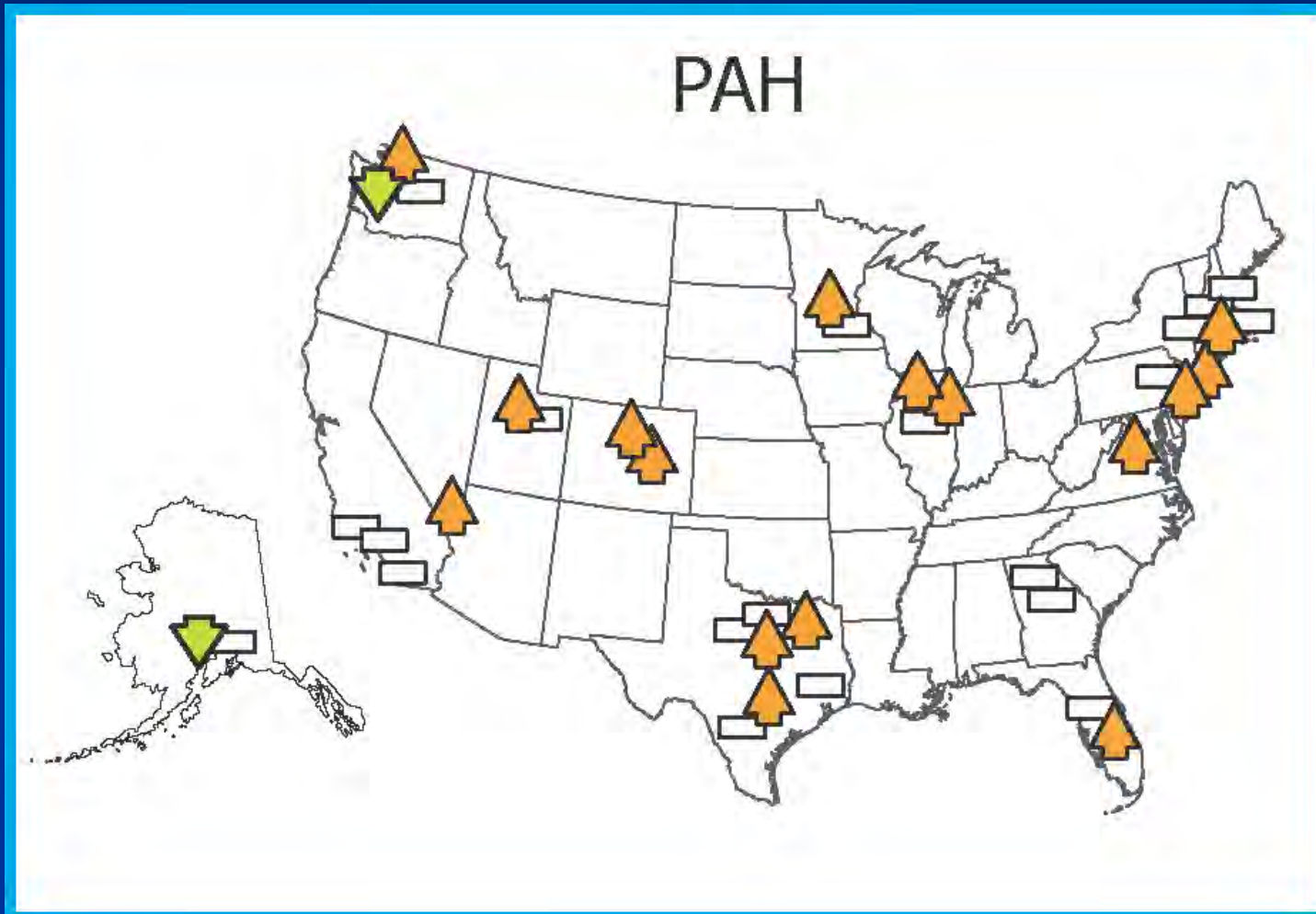
# Trends in Chloride in Streams (1978-2003)



# Lead Trends in Lake Sediment Cores 1965 to Present



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

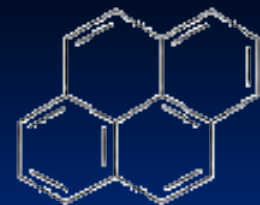
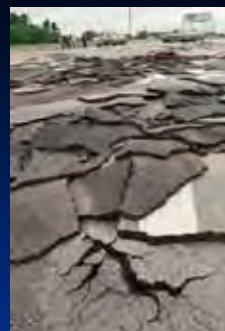


# PAHs Sources?

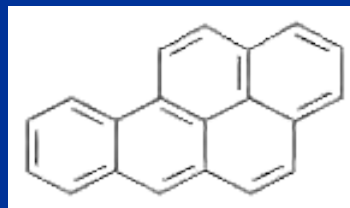
(polycyclic aromatic hydrocarbons)

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

q **Sealcoat**



Pyrene



Benzo (a) pyrene



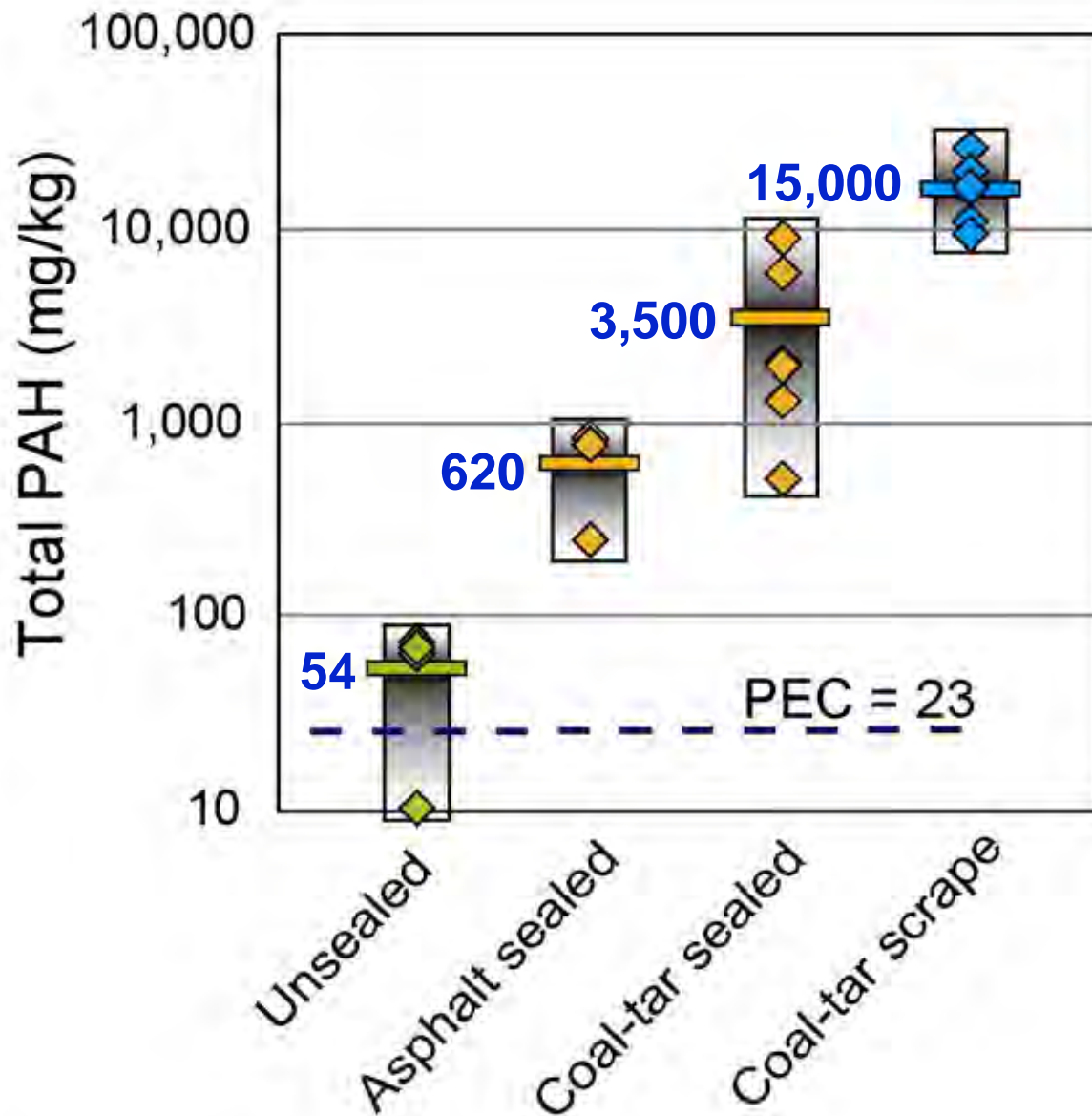


# Refined Coal Tar Sealcoat





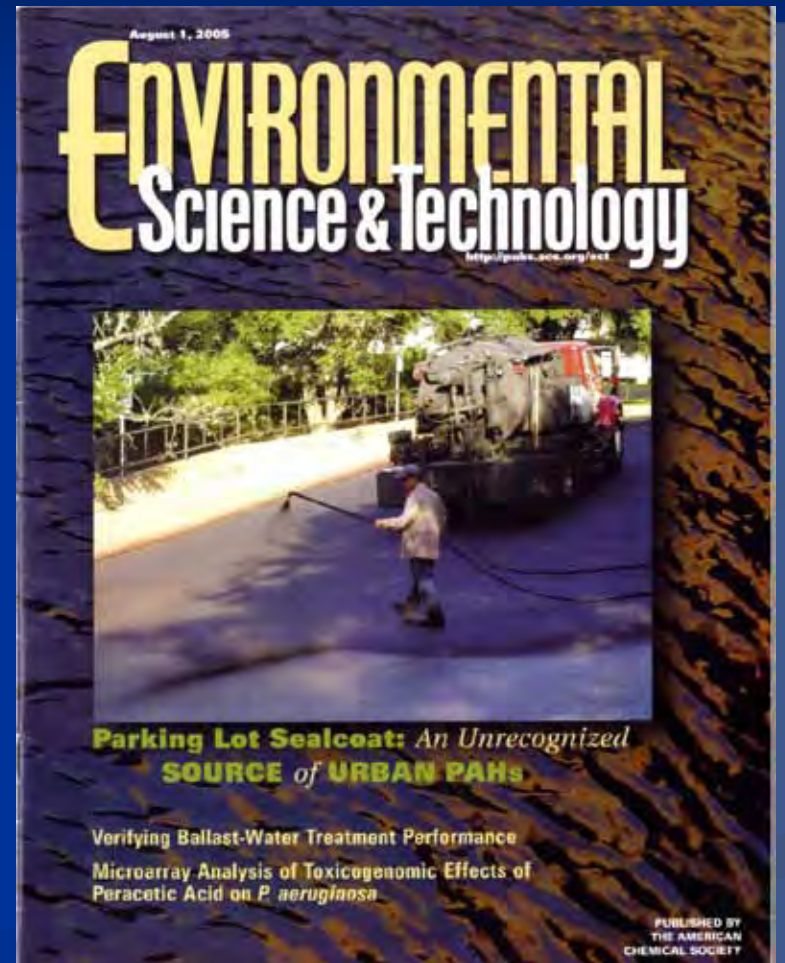
# PAHs in Parking Lot Runoff



- ← Used Oil  
600 mg/kg
- ← Tires  
80-200 mg/kg
- ← Asphalt  
2-10 mg/kg

# Policy Relevance

- q 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?

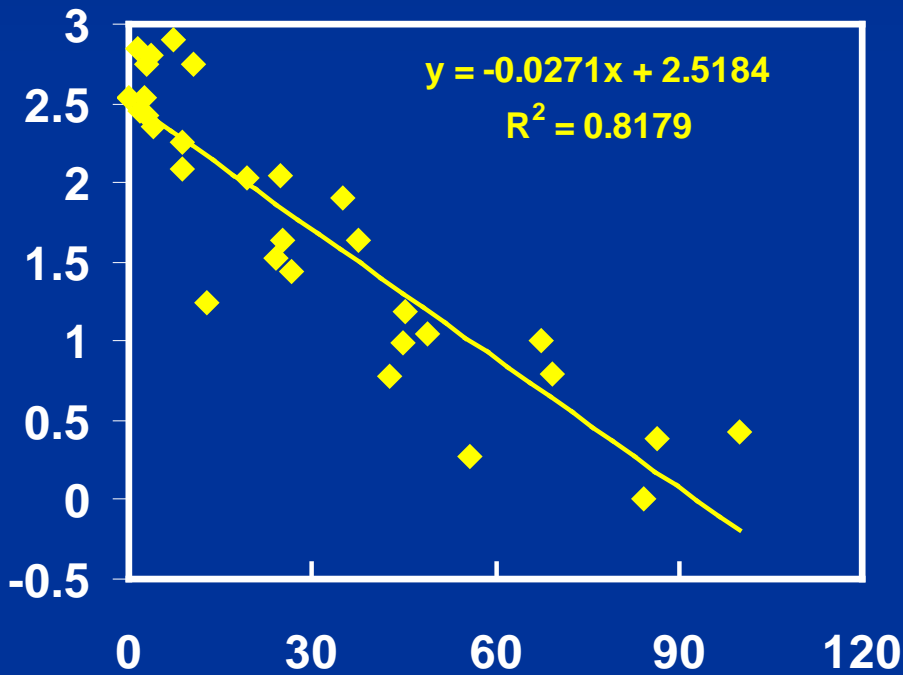




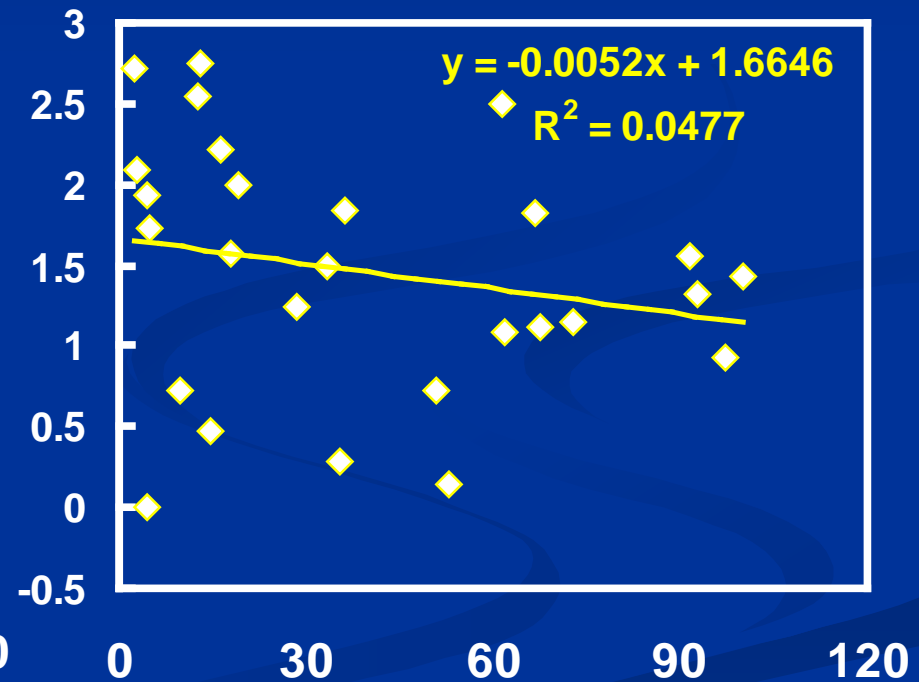
# The effects of urbanization vary by City, but why?

Index of Pollution Sensitive Aquatic Insects

## BOSTON

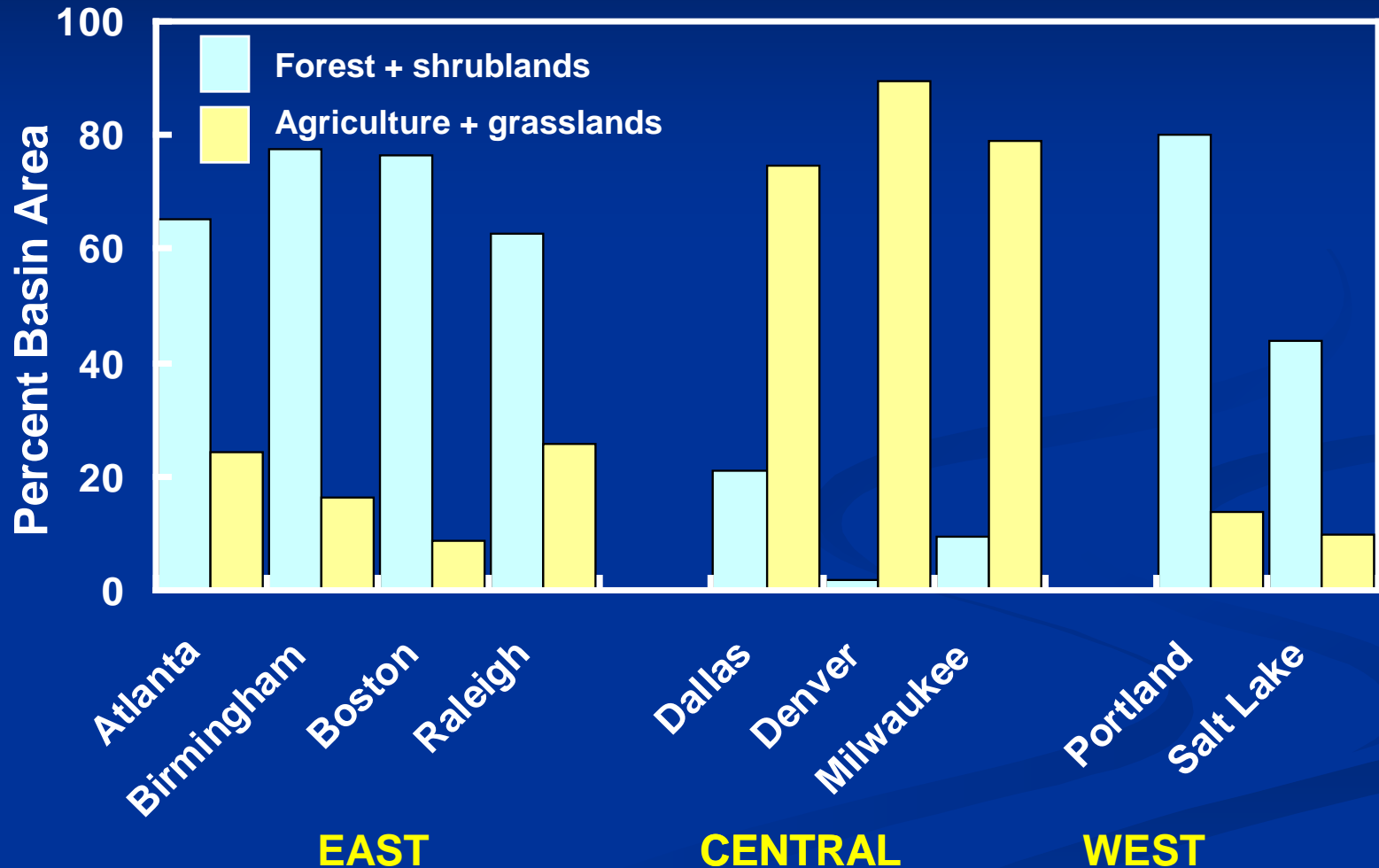


## DENVER



## 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>