Atmospheric Deposition is a Potentially Large Contributor

- Atmospheric deposition of trace metals a significant source to Santa Monica Bay
  - Indirect deposition could be a large fraction of stormwater runoff
- Large scale distribution of trace metal deposition is unknown
  - Last large scale study was in 1975
- Deposition of organics previously unstudied

Atmospheric Deposition Questions

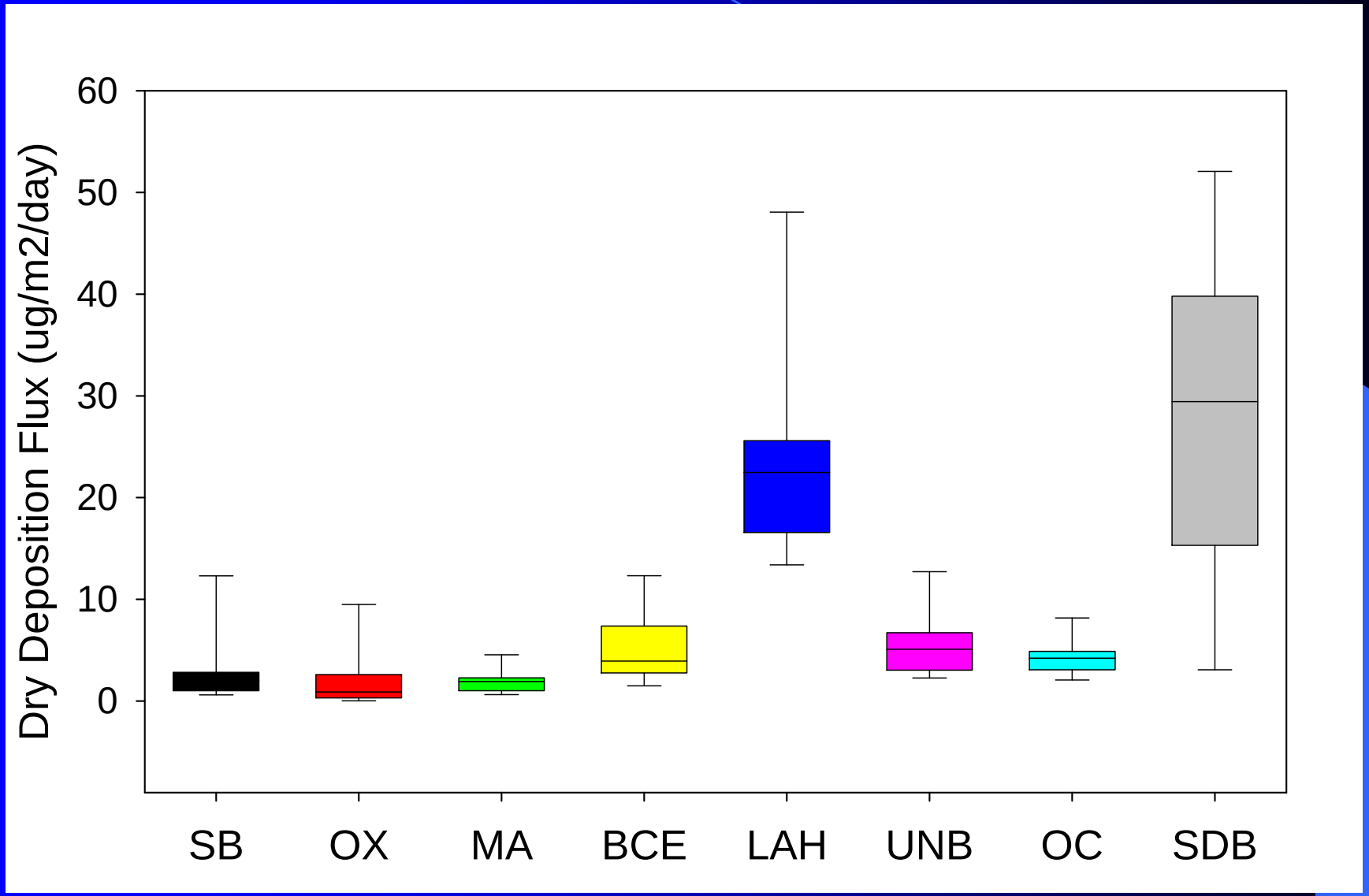
1. What is the air-water flux of trace metals along the So Cal coast?
   - Influence of urban air mass

2. What is the exchange of organic contaminants between environmental compartments?
   - air, water, sediment

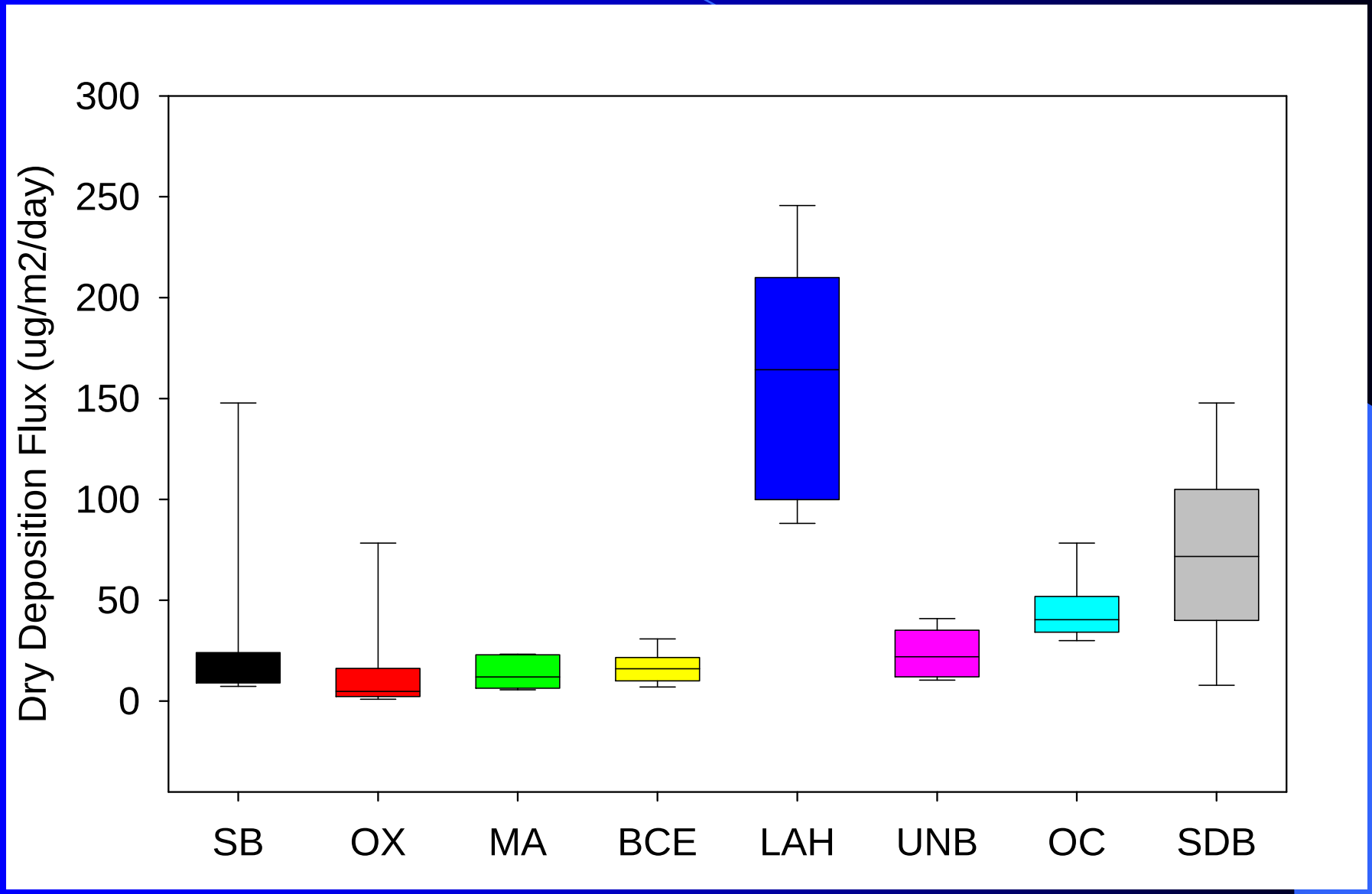
Methods

- Trace metals – coastal transect study
  - Dry particle deposition
  - 8 sites between Santa Barbara and San Diego
  - Comparison with data from 1970's
- Organics – multimedia study at 4 sites
  - Concentrations in air/water/sediment
    - DDT, PCB, PAH, Chlordane, other pesticides
  - Air-water Flux = gas exchange; dry particle deposition
  - Water-Sediment Flux = diffusive flux; sedimentation

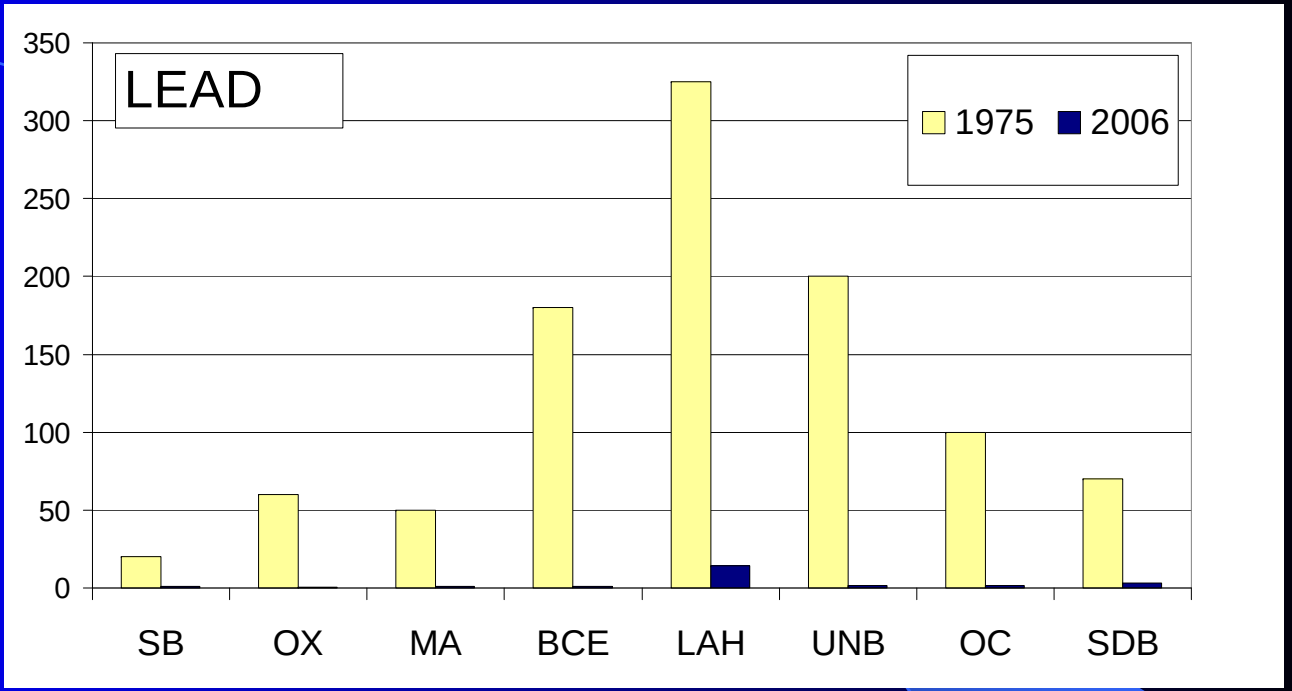
Copper Flux

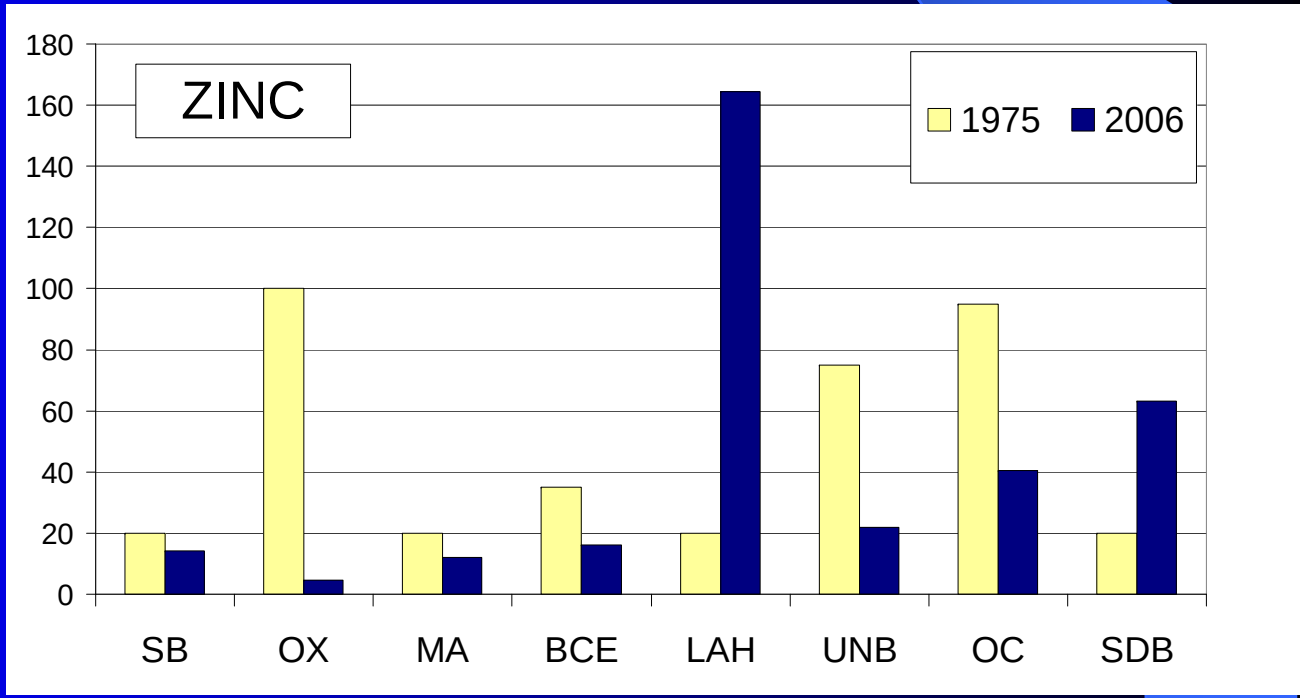

Dry Deposition Flux (ug/m2/day)
60
50
40
30
20
10
0
SB
OX
MA
BCE
LAH
UNB
OC
SDB

Zinc Flux


Dry Deposition Flux (ug/m2/day)
300
250
200
150
100
50
0
SB
OX
MA
BCE
LAH
UNB
OC
SDB

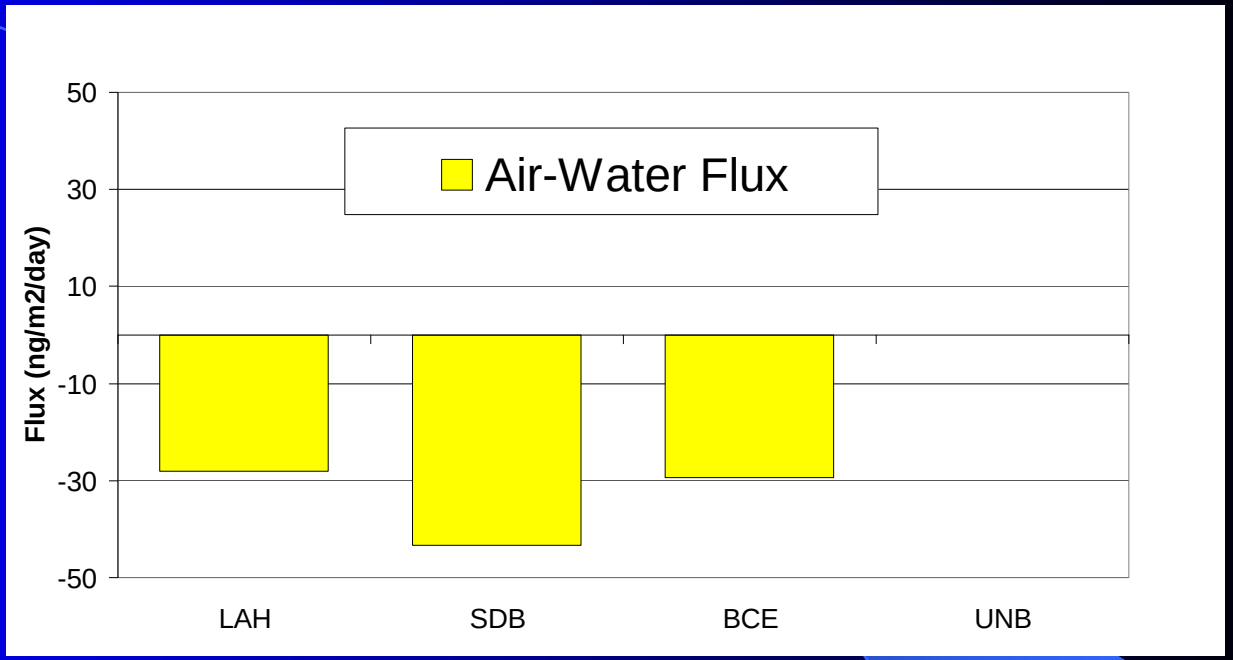
- Lead flux has decreased dramatically since 1975 at all sites
- Zinc flux has increased at LAH and SDB since 1975

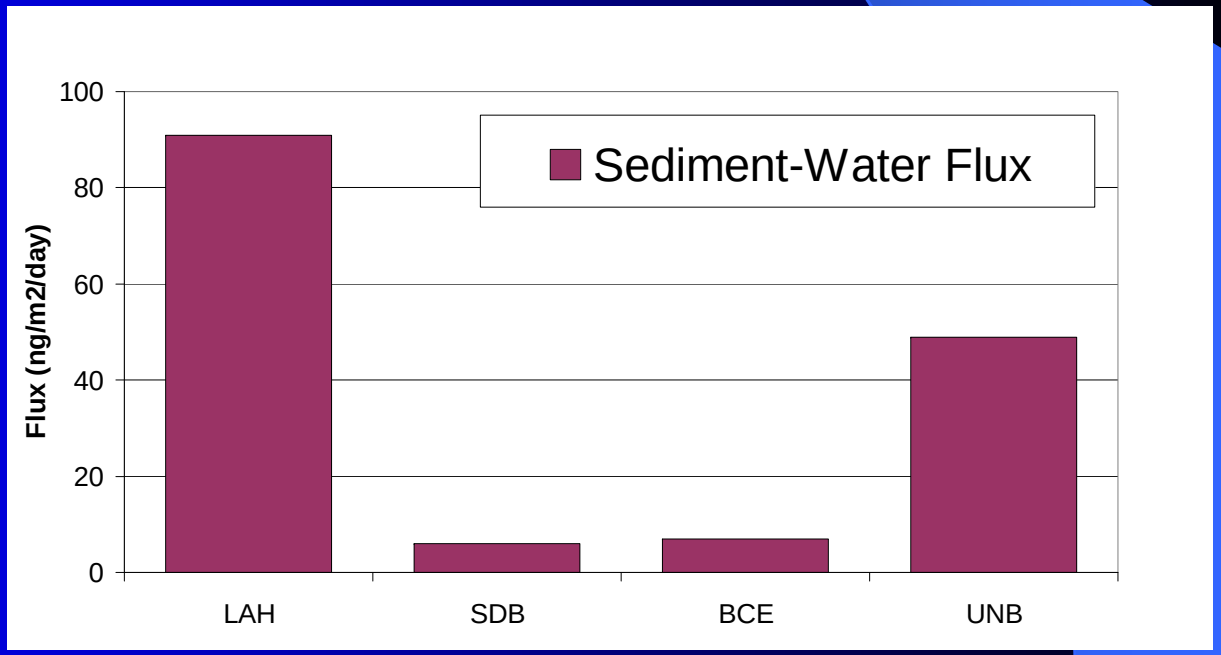




DDT

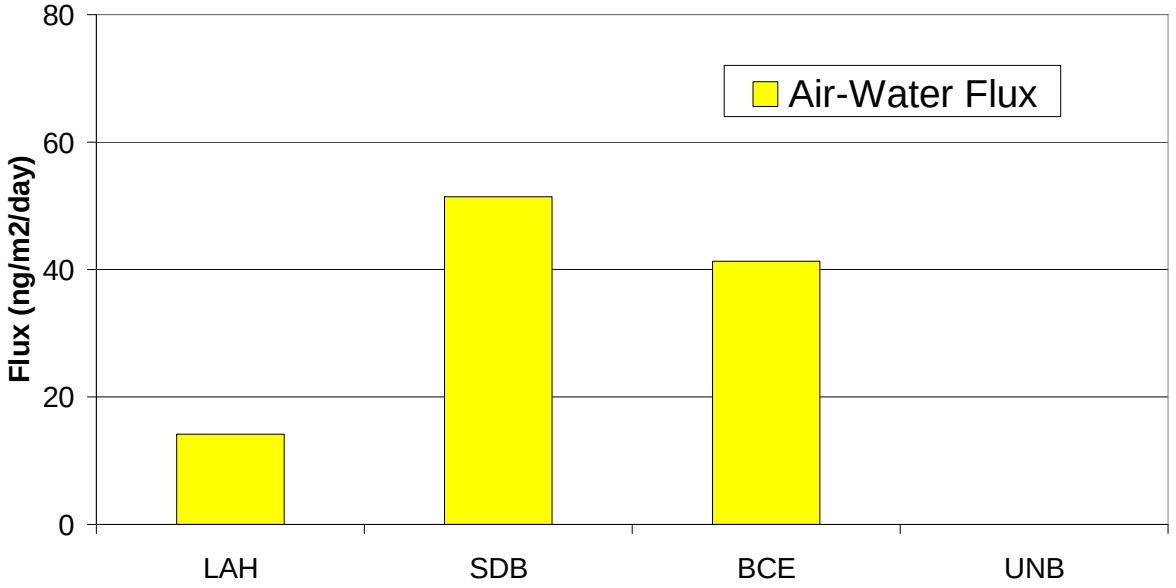
- Atmosphere is a source of DDT to the water column through gas exchange and dry deposition
- Sediment is a source of DDT to the water column
- LAH-sediment is larger source to water than air (~3x)
- SDB-air is larger source to water than sediment

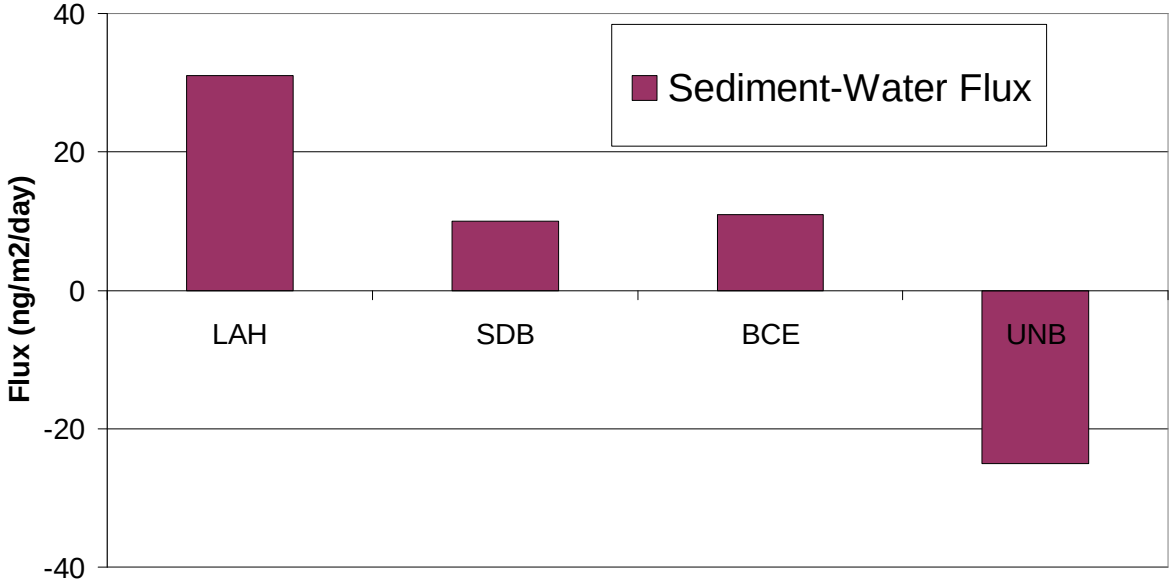




PCB

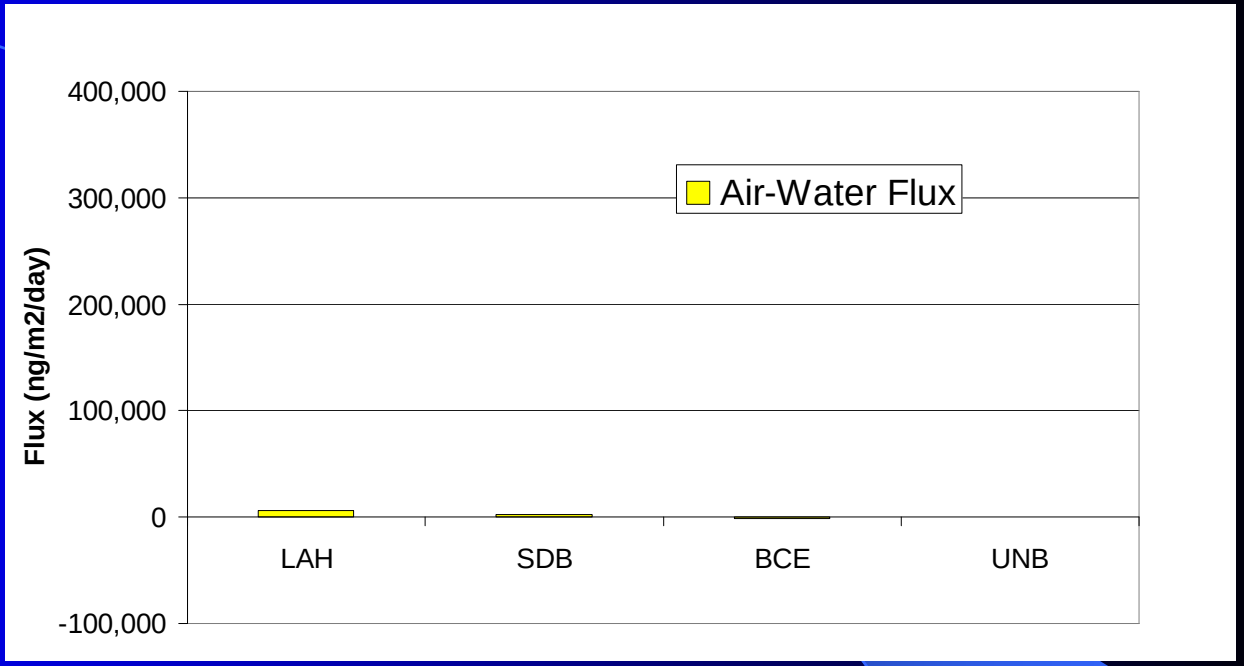
- Water column is a source of PCB to the atmosphere through gas exchange
- Sediment is a source of PCB to the water column through diffusive flux (except at UNB, due to high sedimentation flux)

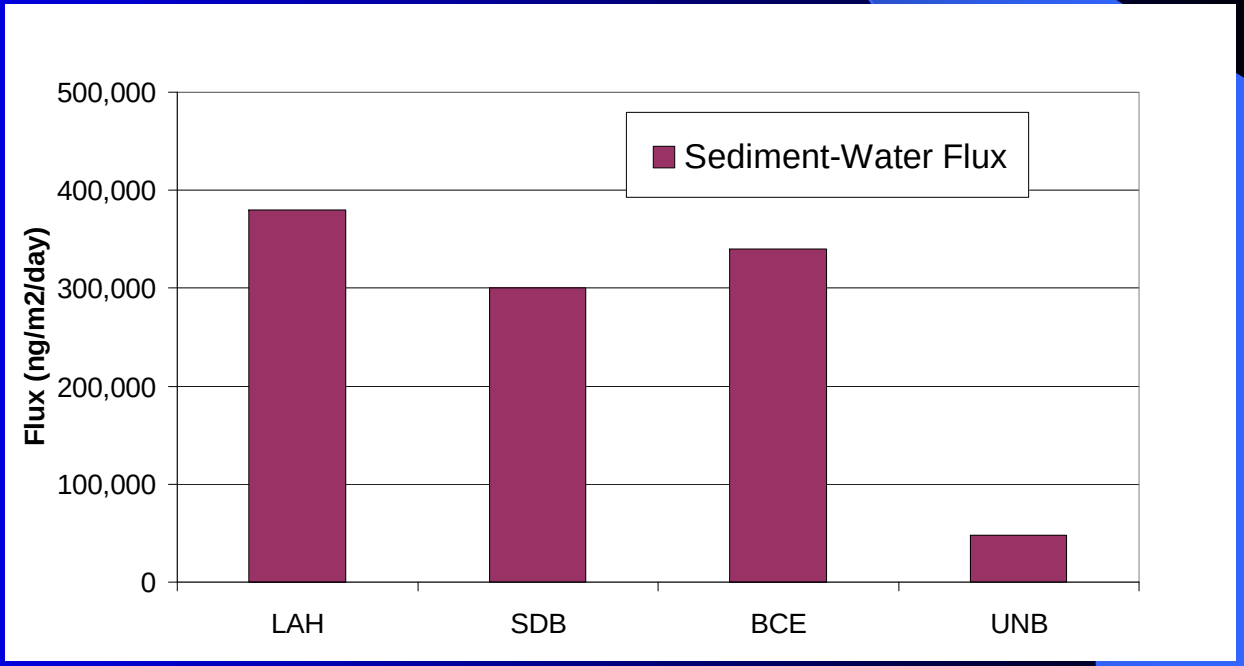




PAH

- Water is a source to the atmosphere through gas exchange
- Sediment is a source to water column through diffusive flux
- Sediment source to water is >> larger than loss to air





Current Status

- Trace metals
  - SCCWRP Technical Report
  - In press at ET&C
- Organics
  - Drafting SCCWRP Technical Report