Great Lakes Binational Toxics Strategy Integration Workgroup Meeting

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Windsor, Ontario

Draft GLBTS Management Assessment for Benzo(a)pyrene (B(a)P)

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B(a)P Challenge Goals

Canada

- Seek a 90% reduction in releases*
- By 2000

* Consistent with 1994 COA

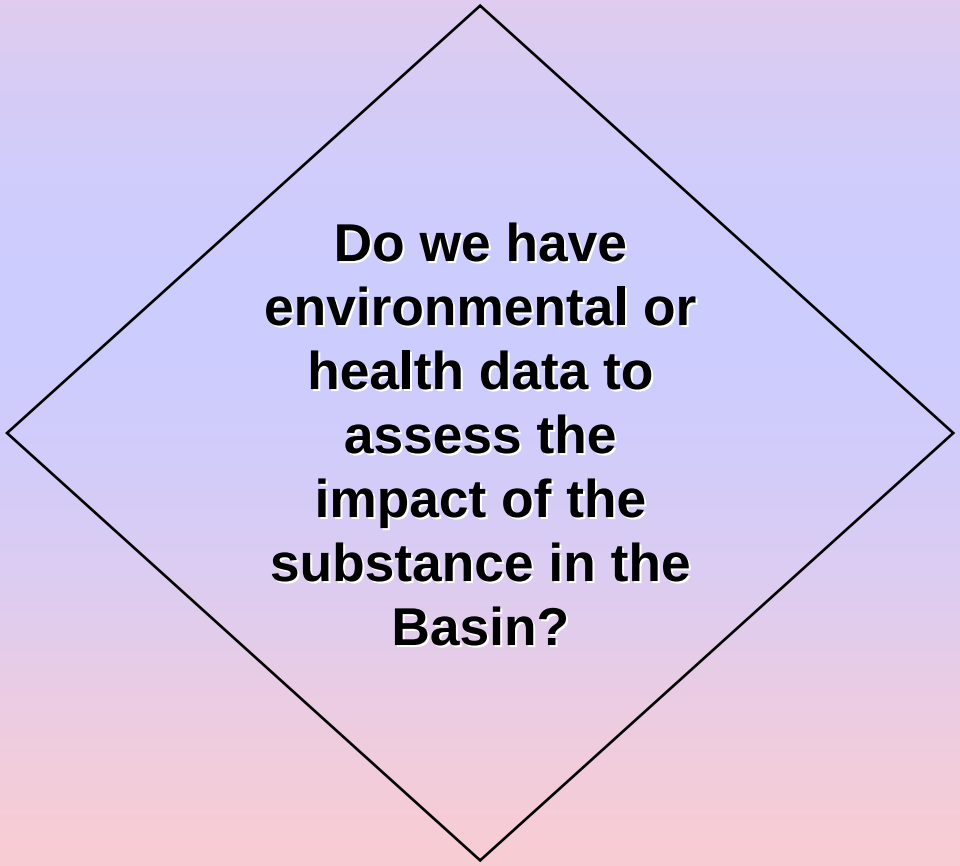
United States

- Seek reductions in releases that are within, or have the potential to enter, the Great Lakes Basin
- By 2006

Progress Toward The Challenge Goals

- Both Canada and the U.S. have achieved reductions
- The U.S. has satisfied its commitment
  - Emissions in Great Lakes reduced by ~ 74% from 1996 to 2001
- Canada continues to pursue goal, but it is unlikely that 90% reduction goal will be met by 2006
  - Ontario releases reduced by ~ 45%, relative to 1988
  - Barriers to progress: 80% of releases are primarily from non-point sources, where it can to difficult to obtain reductions

Environmental Analysis: Environmental and Human Health Data

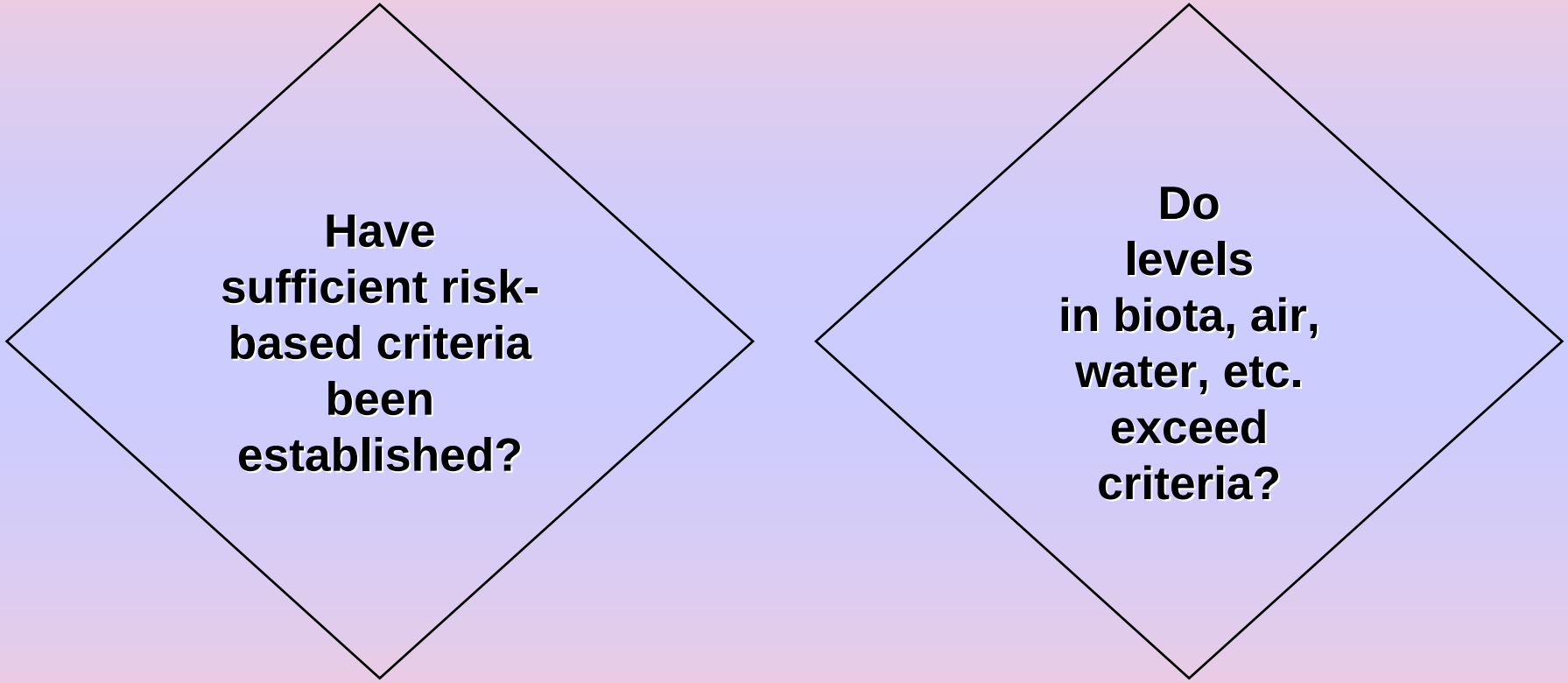


Environmental Analysis: Environmental and Human Health Data Available

- Fish
- Mussels
- Water and Sediments
- Air
- Food & Fish Consumption

- **Conclusion: There are sufficient data on B(a)P in multiple media to assess the impact in the Basin**

Environmental Analysis: Criteria



Environmental Analysis: Criteria

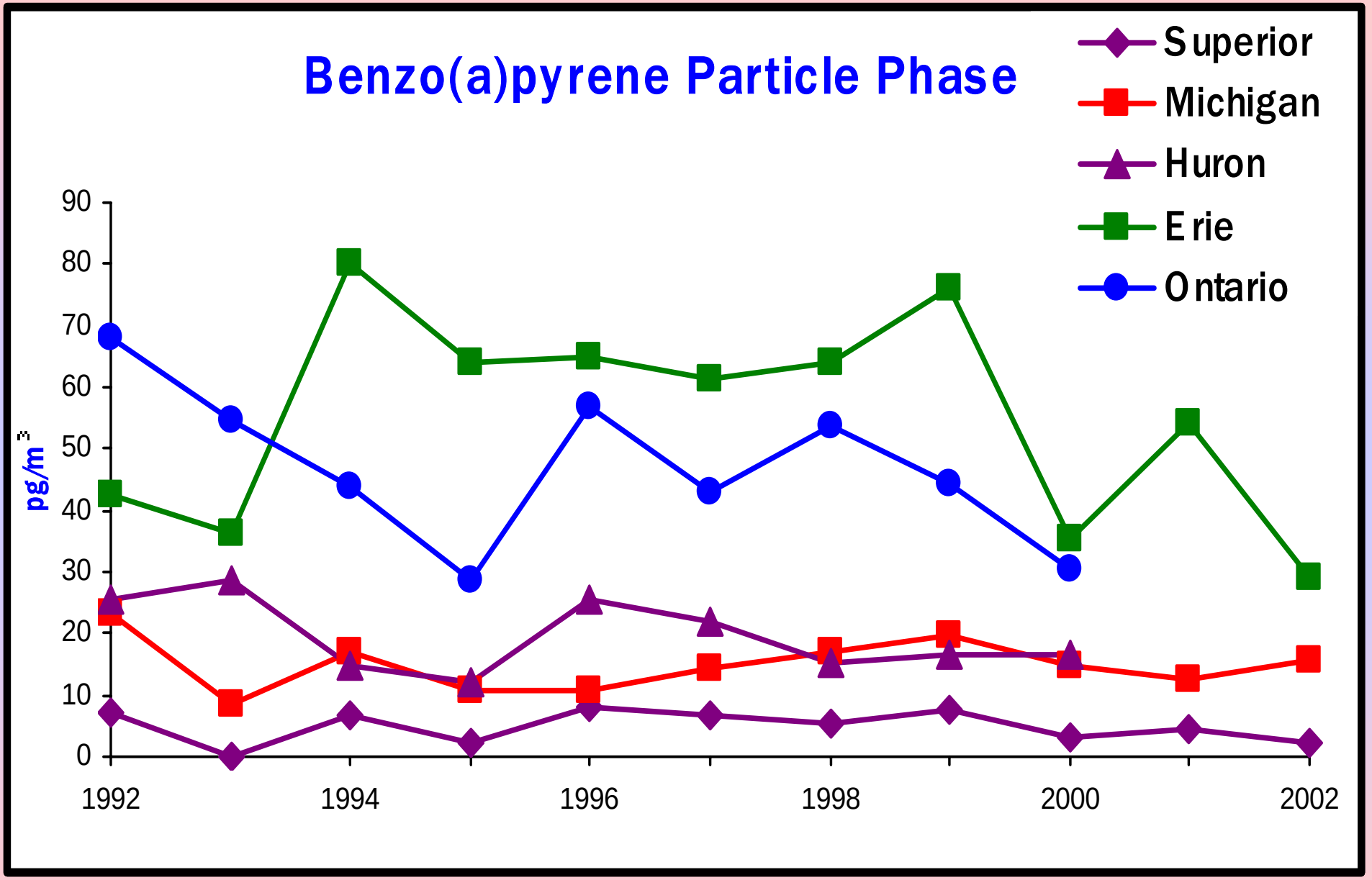
- Criteria developed for B(a)P in nearly all media (fish tissue, aquatic life, air, water, and suspended sediment)
- Levels in Great Lakes sediment exceed criteria (CCME guideline) at:
  - Fort Erie and Niagara-on-the-Lake from 1987 to 2000,
  - Wolfe Island from 1992 to 2000, and
  - Canadian tributaries to Lakes Erie and Ontario (2001-2003)
- No current exceedances of:
  - water quality criteria (US EPA guideline),
  - state ambient air criteria (except zero tolerance level), or
  - fish consumption guidance (no fish advisories in the Great Lakes)
- Levels below detection in fish tissue

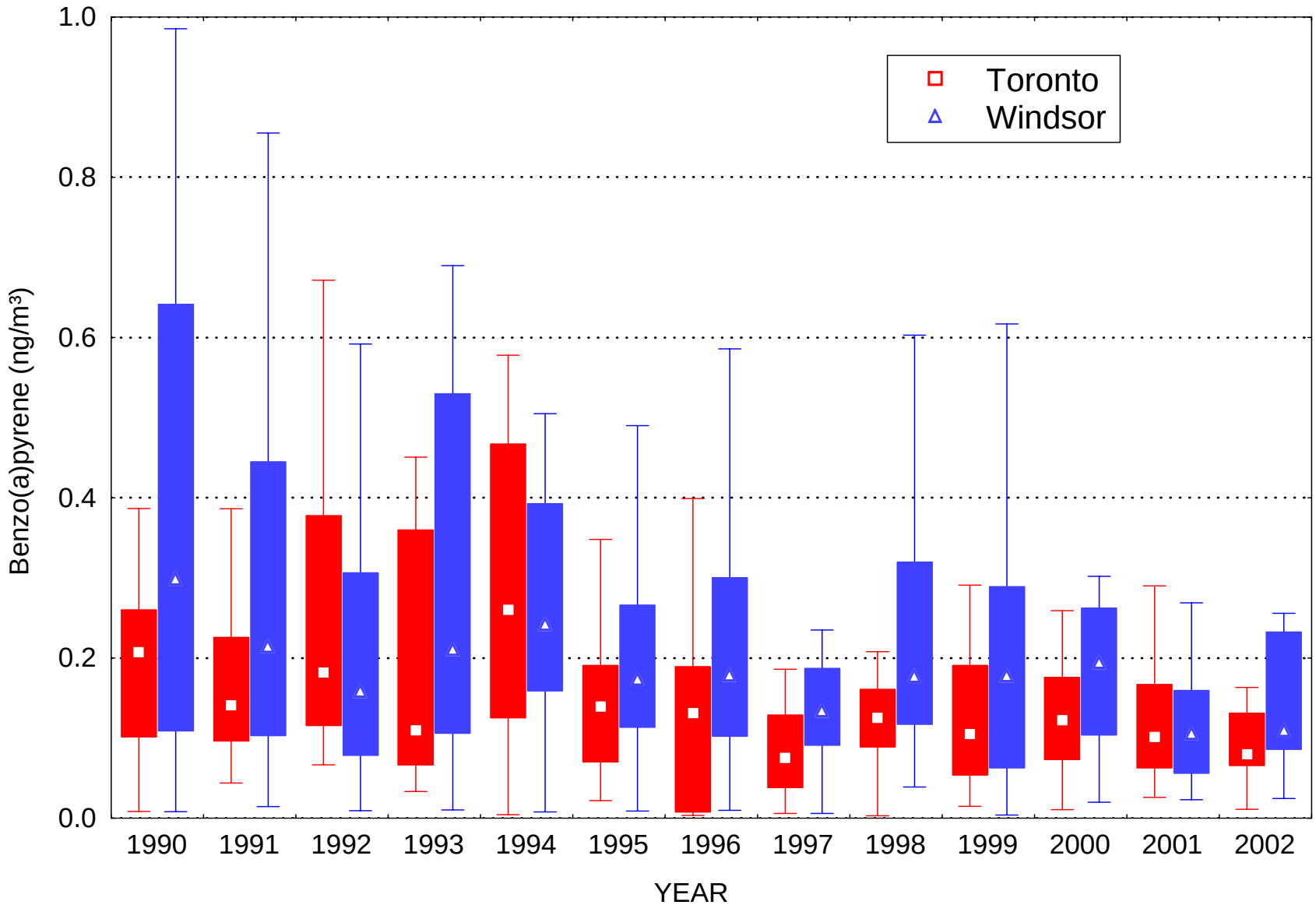
- **Conclusion: B(a)P levels in Great Lakes sediment exceed criteria. B(a)P levels in fish tissue, air, and water are below available criteria**

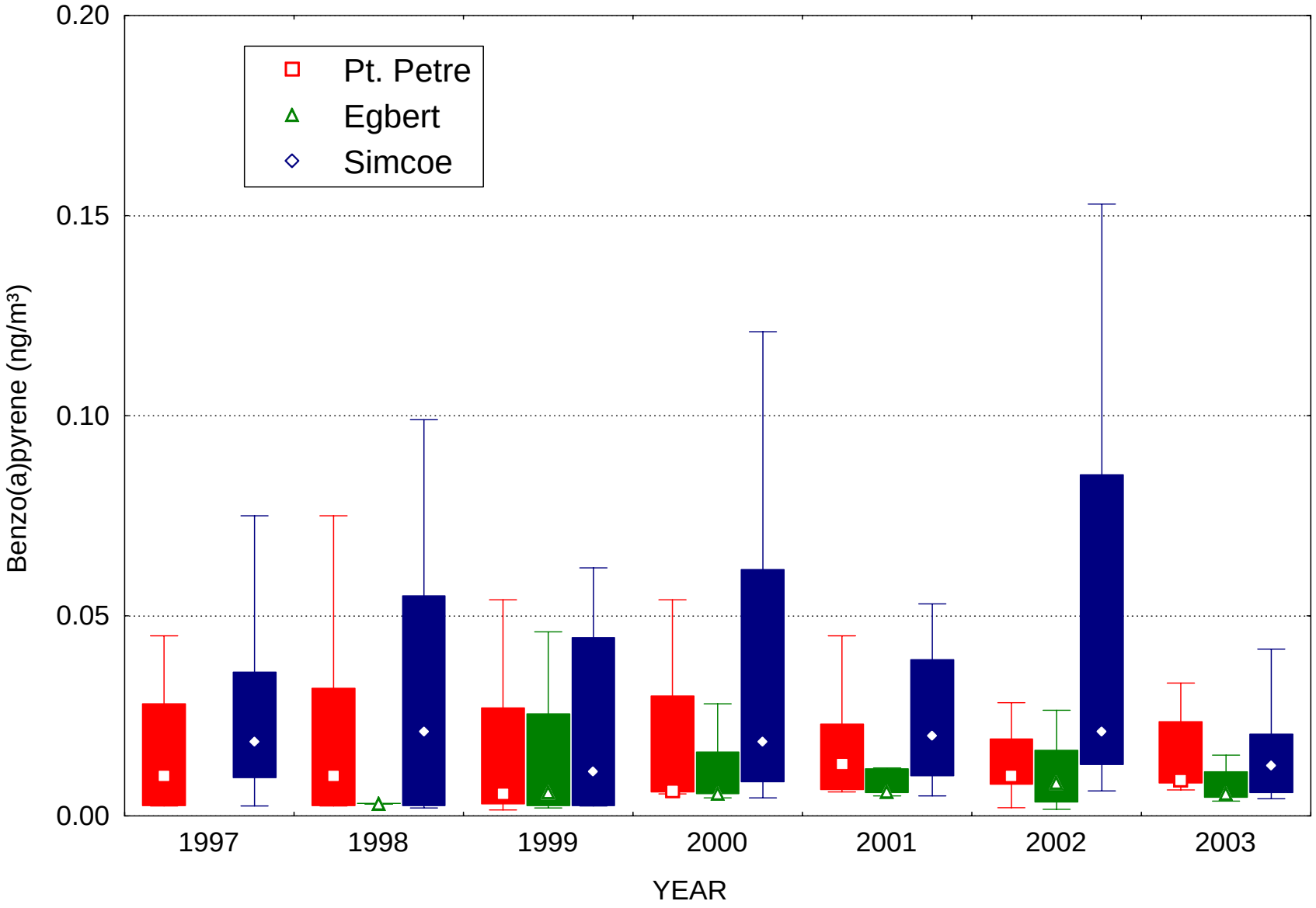
Environmental Analysis: Trends

Environmental Analysis: Trends

- 35% decline in Lake Erie bottom sediment from 1997 to 2002 (data not available for other Great Lakes)
- Along the Niagara River, increasing B(a)P levels in suspended sediment, declining trends in the dissolved phase, and no apparent trend in whole water analysis (which combines sediment & water)
- No apparent trend in available water quality data collected on Lakes Superior, Huron, Erie, and Ontario and Georgian Bay from 1988 to 2002
- Conclusions: No apparent trend in environmental levels over the past decade. Concentrations tend to be higher on Lakes Erie and Ontario than on the other Great Lakes


Benzo(a)pyrene Particle Phase
Superior
Michigan
Huron
Erie
Ontario
pg/m3
90
80
70
60
50
40
30
20
10
0
1992
1994
1996
1998
2000
2002


Toronto
Windsor
Benzo(a)pyrene (ng/m³)
1.0
0.8
0.6
0.4
0.2
0.0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
YEAR


0.20
0.15
0.10
0.05
0.00
Benzo(a)pyrene (ng/m³)
Pt. Petre
Egbert
Simcoe
1997
1998
1999
2000
2001
2002
2003
YEAR

Environmental Analysis Conclusions

- Basinwide environmental data indicate little change in B(a)P concentrations in the Great Lakes over the past decade
- Higher concentrations on Lakes Erie and Ontario, sites near major population centers
- A recent declining trend reported in Lake Erie bottom sediment, the only lake with available lakewide sediment data

Environmental Analysis Conclusions (continued)

- Exceedances of Canadian sediment quality guidelines reported in the past few years in Canadian tributaries to Lakes Erie and Ontario, and along the Niagara and St. Lawrence Rivers
- B(a)P levels in Great Lakes fish tissue, air, and water below available criteria
- No fish consumption advisories for B(a)P in any of the Great Lakes

Sources: Ontario Inventory*

- Residential Wood Combustion (51%)
- Iron & Steel (21%)
- Wood Preservation (product use) (15%)
- Motor Vehicles (6%)
- Other (7%)
- Total estimated releases = 13,438 kg/year

*Anthropogenic sources, excludes forest fires

Source: Environment Canada 2003 Release Update

Sources: Great Lakes Inventory

- Residential Wood Combustion (40%)
- Blast Furnaces and Steel Mills (29%)
- Petroleum Refining (9%)
- Other (22%)
- Inventory includes estimates for IL, IN, MI, MN, OH, WI, and Ontario (NY and PA data missing)
- Other apparent inventory omissions (e.g., creosote-treated wood preservation)

Source: 2001 Great Lakes Regional Air Toxic Emissions Inventory

Potential Current Sources

- Forest and Wildfires
- Residential Burning of Household Waste
- Scrap Tire Fires
- Prescribed Burning
- Mobile Sources
- Structure Fires
- Agricultural Burning

Sources: USEPA 1999 NEI, Environmental Health Strategies issue papers, & Environment Canada

Ability for the GLBTS to Affect Further Reductions

- Continue efforts to reduce emissions from residential wood combustion (e.g., wood-stove change-out & *Burn It Smart* programs)
- Continue to refine current B(a)P inventories for Great Lakes states and Ontario
- Support scrap tire abatement efforts in U.S. and Ontario
- Support Burn Barrel Subgroup
- Joint opportunities with Dioxin Workgroup

Management Outcomes

- Keep current challenge goals
  - Setting new challenge goals not practical due to lack of complete and accurate inventories
- Continue workgroup efforts
- Active Level 1 status with periodic reassessment by the GLBTS