

Benzo(a)Pyrene Hexachlorobenzene

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B(a)P and HCB Challenges

United States

“Seek by 2006, reductions in releases that are within, or have the potential to enter, the Great Lakes Basin, of HCB and B(a)P from sources resulting from human activities”

Canada

“Seek by 2000, a 90% reduction in releases of HCB and B(a)P resulting from human activities in the Great Lakes basin, consistent with the Canada Ontario Agreement”

Accomplishments

Estimated Reductions (since ~ 1988):

Canada: (Great Lakes)

- HCB ~ 62% reduction
- B(a)P ~ 45% reduction

United States:

- HCB (nationally) ~ 90% reduction from chlorinated solvents and pesticide manufacturing
- B(a)P (Great Lakes) ~ 65% reduction from coke ovens and an over 90% reduction from primary aluminum reduction plants and petroleum refineries

Accomplishments: Recent Canadian Progress

- **Winter 2003-2004: Fifty-one (51) Ontario “Burn it Smart” wood stove workshops; 111 workshops in 60 Ontario communities since 2002**
- **December 2003: Hospital incinerators cease operations (Ont. Reg. 323/02), adding to overall HCB reductions from incineration sector**
- **Issue Papers prepared: New B(a)P release estimates for uncontrolled combustion sector (i.e. wildfires, prescribed burning, tire fires, structural fires)**
- **Canada-Ontario Agreement workplans being implemented: commitments resulting in additional reductions**
- **Ontario’s on-road motor vehicle sector B(a)P releases updated**

Overview of Canadian B(a)P and HCB Reductions

B(a)P:

- ◆ **Iron and Steel:** a 74% reduction in PAH/B(a)P emissions by Ontario's Integrated steel producers, as a result of voluntary agreements and new SOP codes of practice
- ◆ **Residential Wood Combustion:** Stove change-out and outreach impacting on releases (Burn it Smart! workshops)
- ◆ **Wood Preservation:** New SOP codes of practice being implemented; creosoting facility B(a)P releases no longer significant

HCB:

- ◆ **Waste Incineration:** >80% HCB reduction achieved in Ontario's incineration sector as a result of Canada Wide Standards (municipal, hazardous, sewage sludge and biomedical wastes)
- ◆ **Pesticide Application:** Major HCB reductions achieved; need critical HCB release data in order to quantify remaining releases

Accomplishments: Recent United States Progress

- **Wood Stove Change-out Programs with Hearth Products Association completed in 12 States**
- **A complete Inventory (and GIS maps) of scrap tire piles and a brochure showing sites and listing State incentive programs for stockpile mitigation have been developed**
- **EPA's Wood Stove Initiative is developing health and safety based outreach materials, including a website, and is considering a variety of wood smoke reduction programs**
- **Several chemical companies have greatly reduced or eliminated their HCB emissions**

Overview of U.S. B(a)P and HCB Reductions

B(a)P:

- **Residential Wood Combustion:** Steady decrease in emissions due to change-out programs and outreach
- **Petroleum Refining:** Test data indicates that this is no longer a significant source
- **Coke Ovens:** Continued decrease in emissions
- **Primary Aluminum:** Alcoa's Warrick Plant reduced emissions over 95%
- **Scrap Tires:** In the Great Lakes region, Illinois, Wisconsin and Minnesota have successfully cleaned up most large scrap tire stockpiles

HCB:

- **Albermarle Corp. PDC, LA:** Air releases reduced from 111 lbs/yr to zero
- **Dow, Texas:** Air releases reduced from 118 lbs/yr to 22 lbs/yr
- **Dow, LA:** Air releases decreased from 265 lbs/yr to 52 lbs/yr
- **Vulcan Materials, LA:** Water releases decreased from 7 lbs/yr to 2 lbs/yr

Major Source Sectors

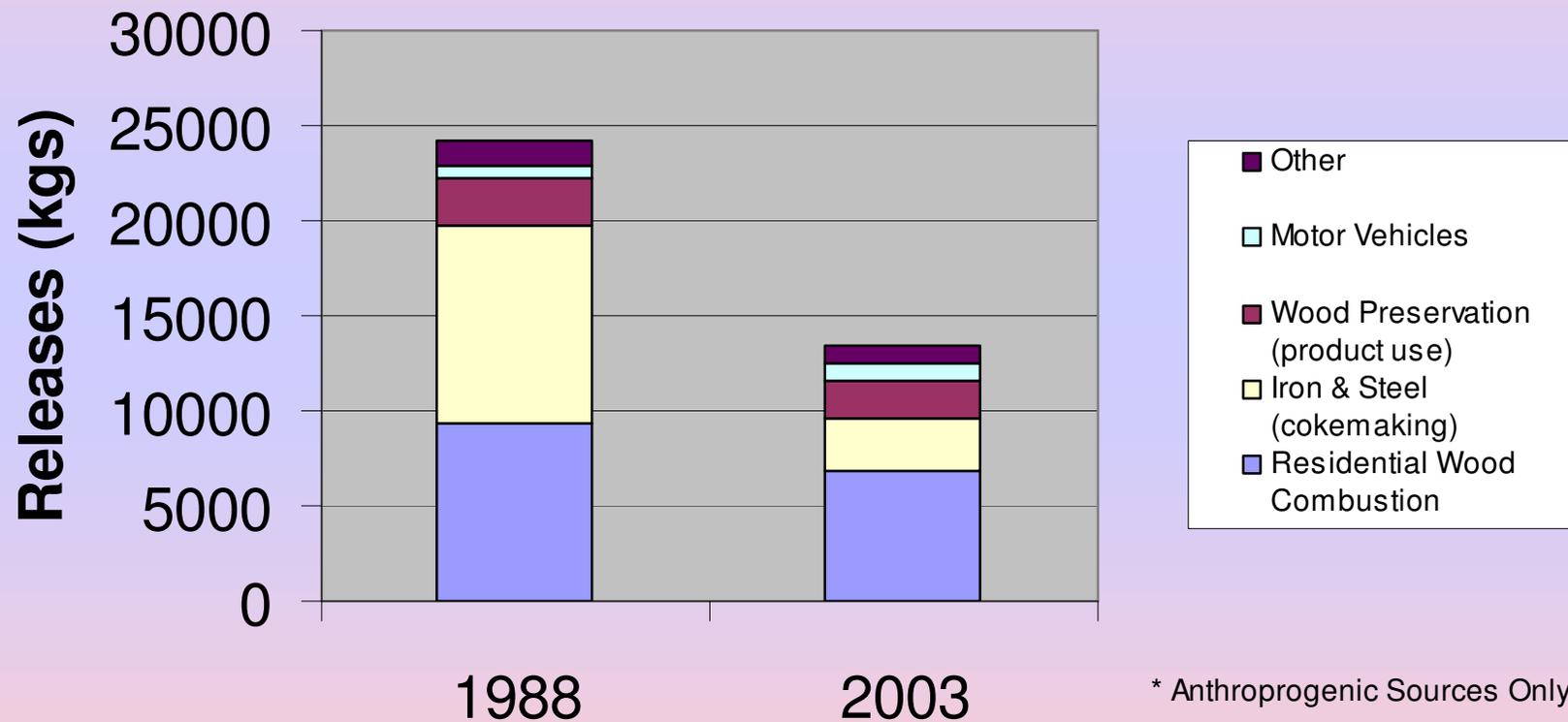
B(a)P:

- Coke ovens
- Wood preservation
- Residential wood combustion

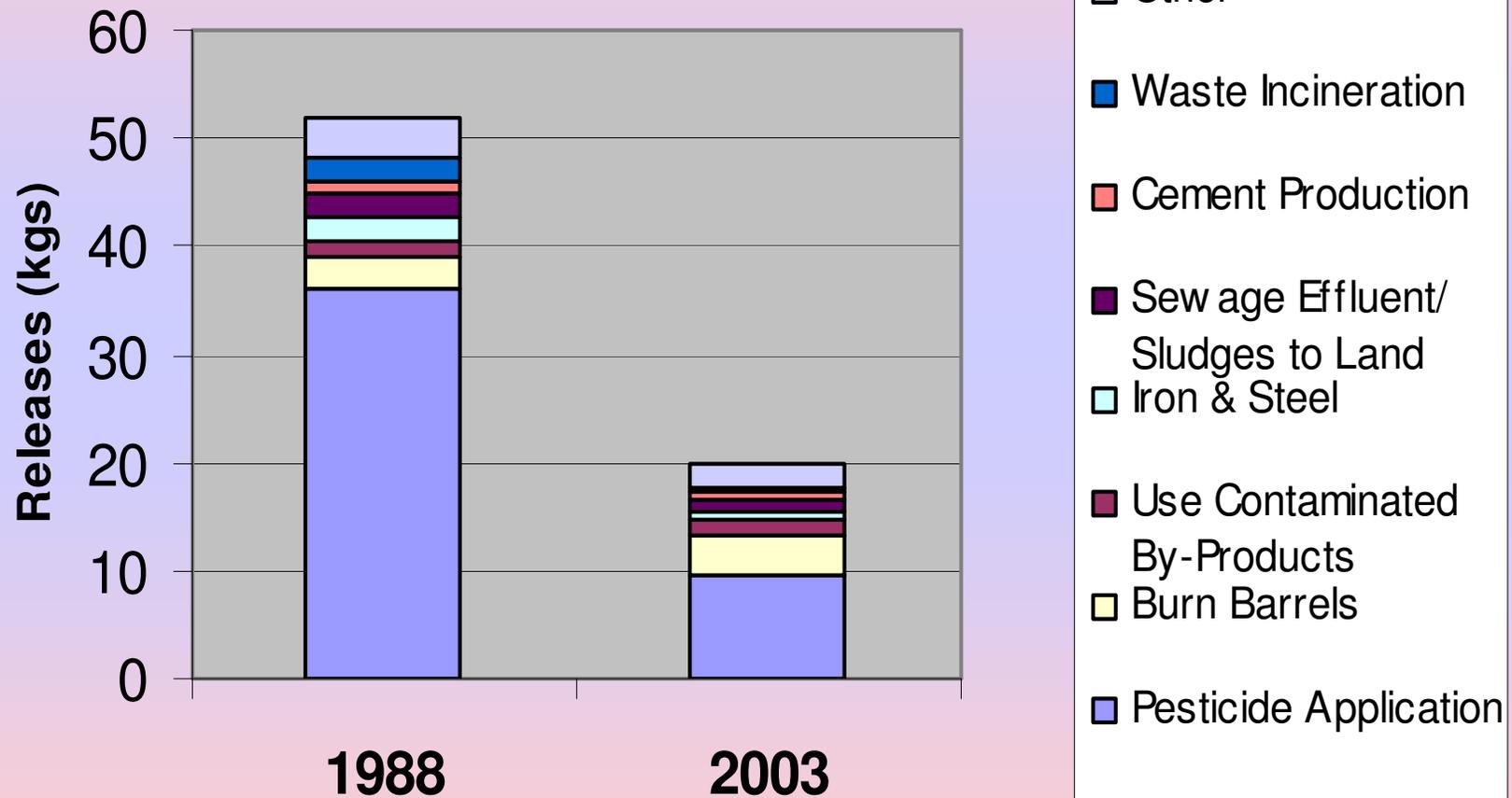
HCB:

- Chlorinated solvents and pesticides manufacturing
- Chlorine production
- Pesticide applications
- Waste incineration

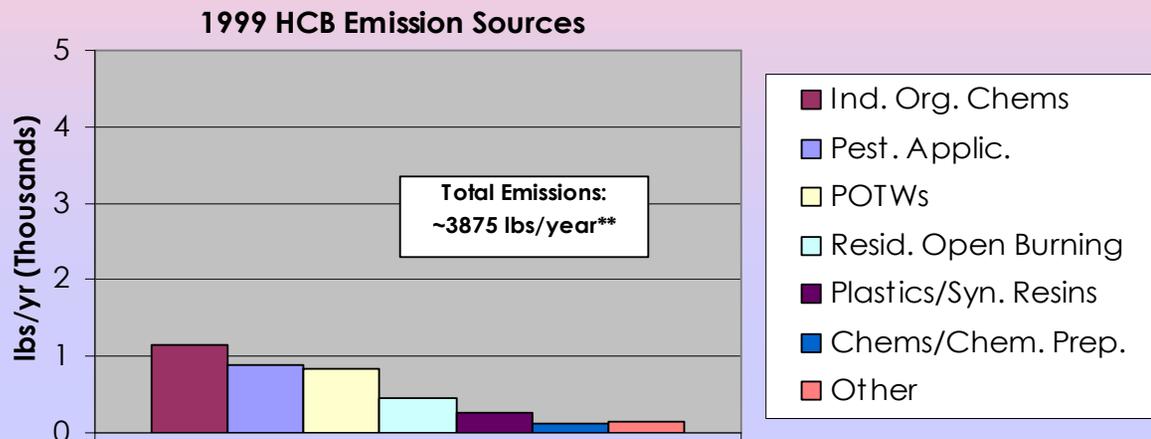
Estimated Ontario B(a)P Releases*



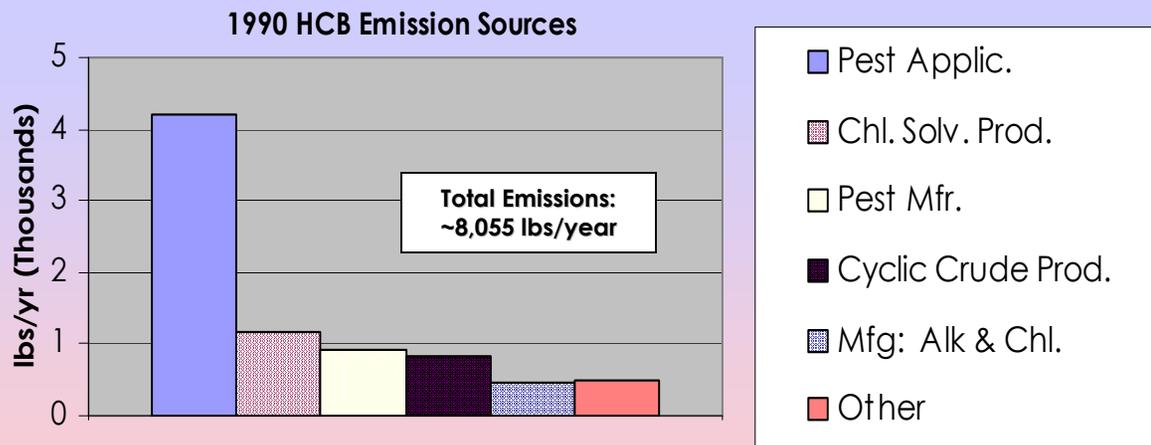
Estimated Ontario HCB Releases



Estimated U.S. HCB Emissions



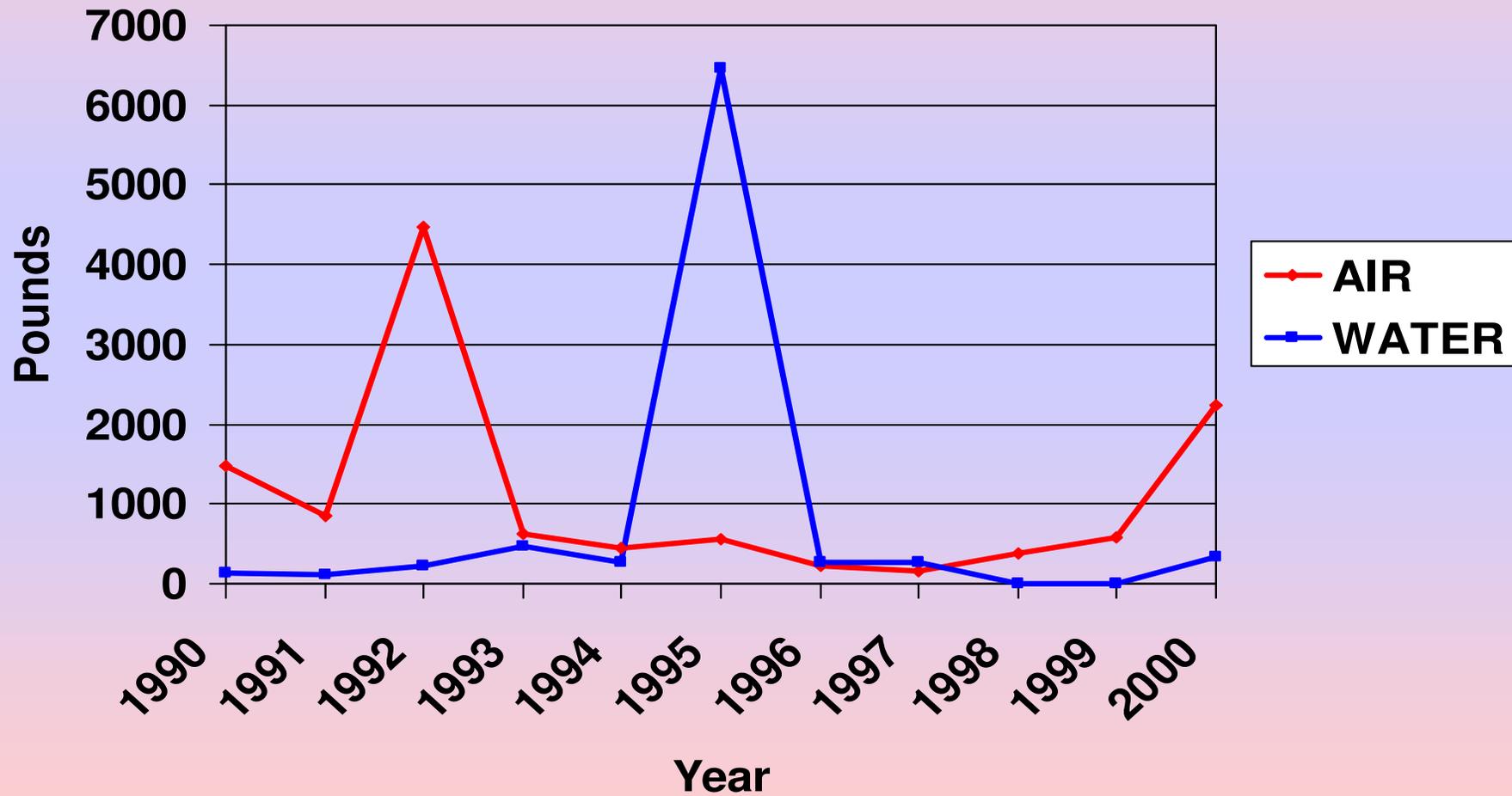
**** 1999 Data excludes 7,458 lbs of HCB emissions reported by Onyx Environmental Services (amount could not be verified). Total 1999 emissions including Onyx data = 11,333 lbs**



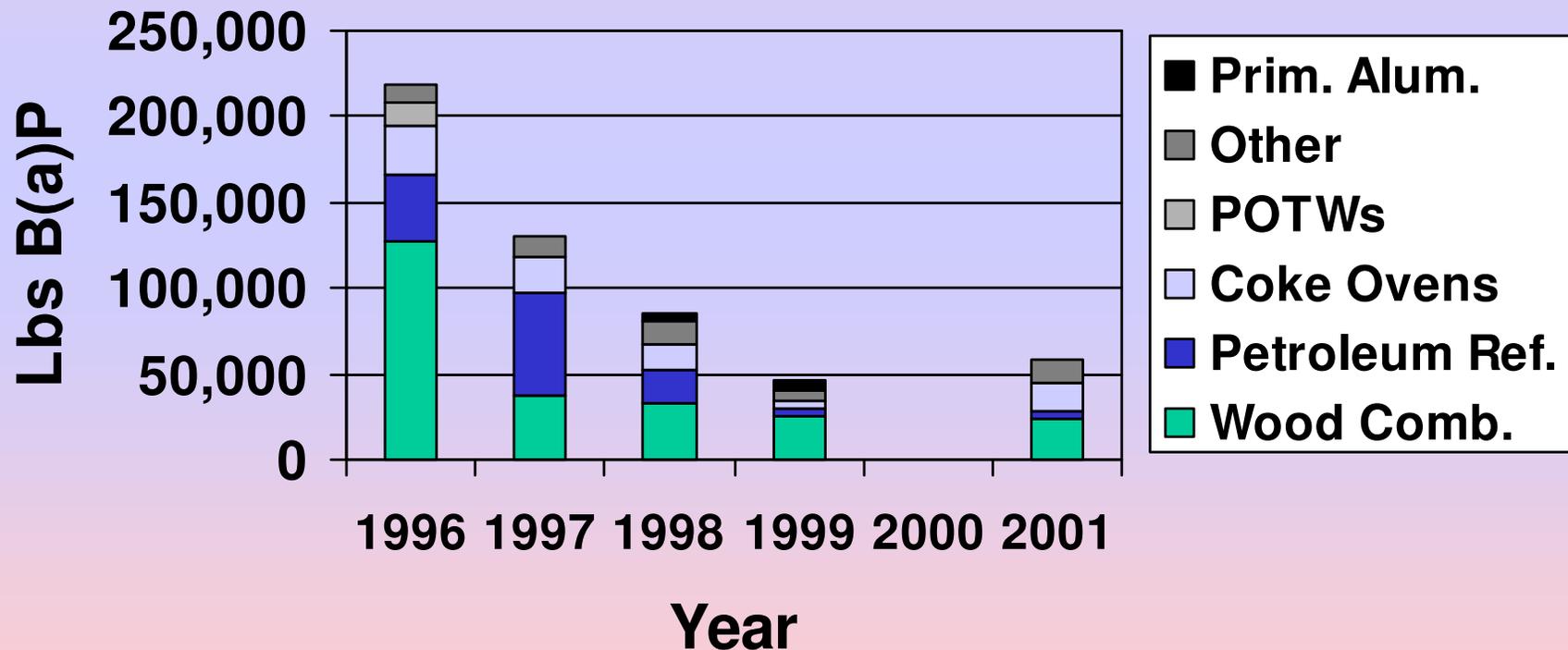
Sources:
 EPA 1990 National Toxics Inventory and 1999 National Emissions Inventory data updated with 1999 pesticide application emissions data.

Note: Pesticide application data assumes 100% volatilization of the HCB contaminant in pesticides

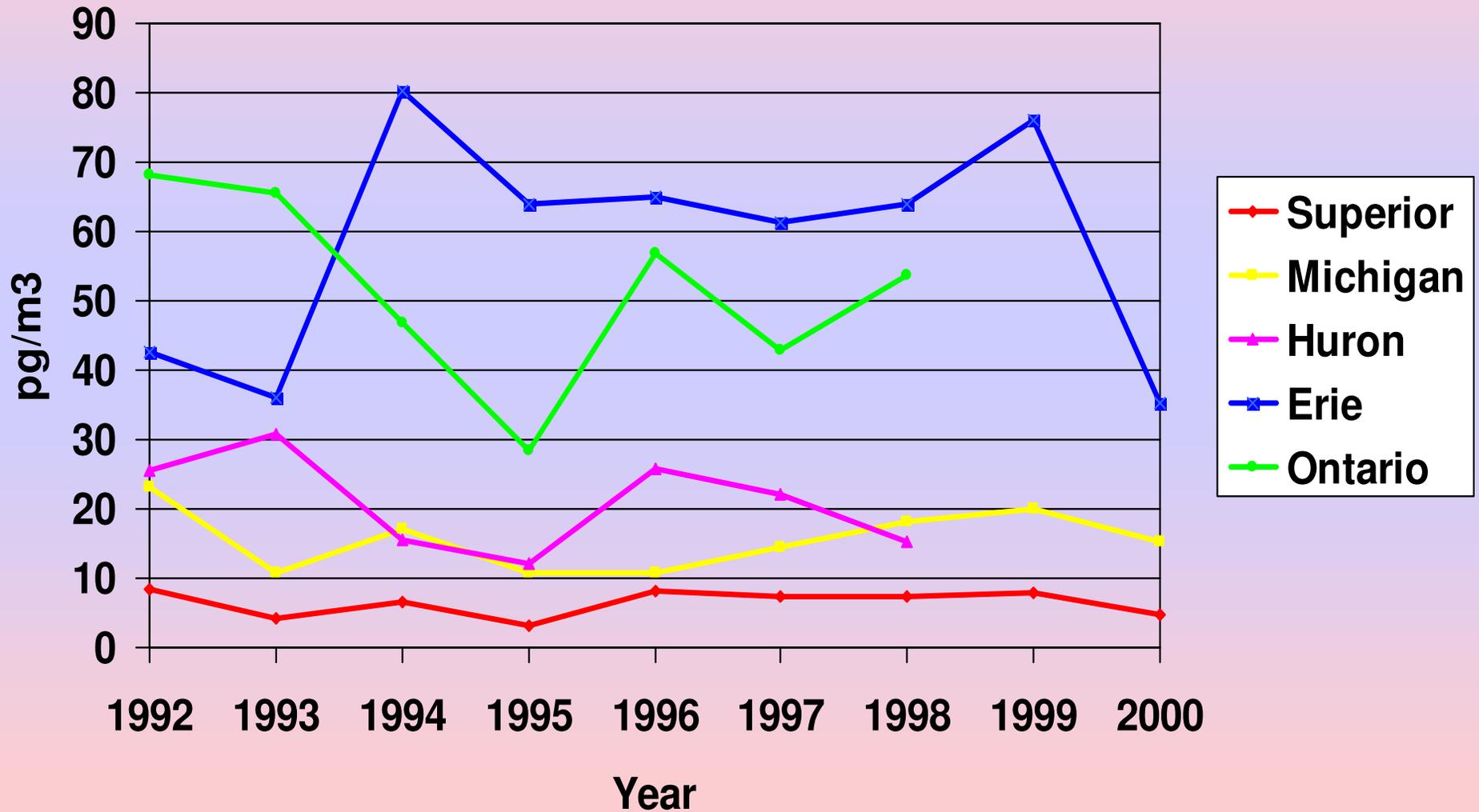
U.S. HCB TRI-Reported Emissions (lbs/yr)



U.S. Benzo(a)pyrene Emissions



Concentrations of B(a)P in Particulate Phase (IADN Monitoring Data)



Barriers

- **(Anthropogenic) B(a)P releases from many combustion sources - technological and societal changes required to effect significant reductions**
- **(Non-anthropogenic) B(a)P releases from forest fires dominant**
- **Lack of chemical use and emission data - Progress slow on closing data gaps**
- **Need to recruit Work Group members**
- **Need more resources to initiate more sector-specific projects**
- **Health & environmental data gaps on B(a)P exposure to residential wood combustion and vehicle emissions**

Upcoming Actions

- **Continue work with pesticides and other sectors to refine release estimates**
- **Continue outreach on residential wood combustion**
 - ◆ **“Burn it Smart!” Ontario Campaign**
 - ◆ **A Voluntary Woodstove/Fireplace Smoke Reduction Activities and Outreach Materials Contract (awarded by EPA)**
- **Meet with facilities not reporting or with “Low Confidence” NPRI estimates**
- **USEPA scrap tire pile inventory and GIS mapping project**
- **New prevention projects — e.g., scrap tires**