

A scenic sunset over a body of water. The sky is a mix of dark blue, purple, and red, with the sun low on the horizon, creating a bright glow. The water reflects the colors of the sky. In the foreground, the bow of a wooden boat is visible on the left side.

Great Lakes Binational Toxics Strategy

**Identify and Quantify the Storage, Release
and Use of Toxic Substances in Severn
Sound**

June 11th, 2003

The 7th Canadian Pollution Prevention Roundtable

Calgary

The Great Lakes: A Precious Resource

- **20% of world fresh surface water supply**
- **33 million people; 9 million Canadians**
- **45% of Canadian industry**
- **33% of US Manufacturing**
- **25% of Canadian agriculture**
- **\$180 billion in Canada-U.S. trade**
- **\$450 million fishery industry**
- **1.5 million recreational boaters**

Today's Presentation

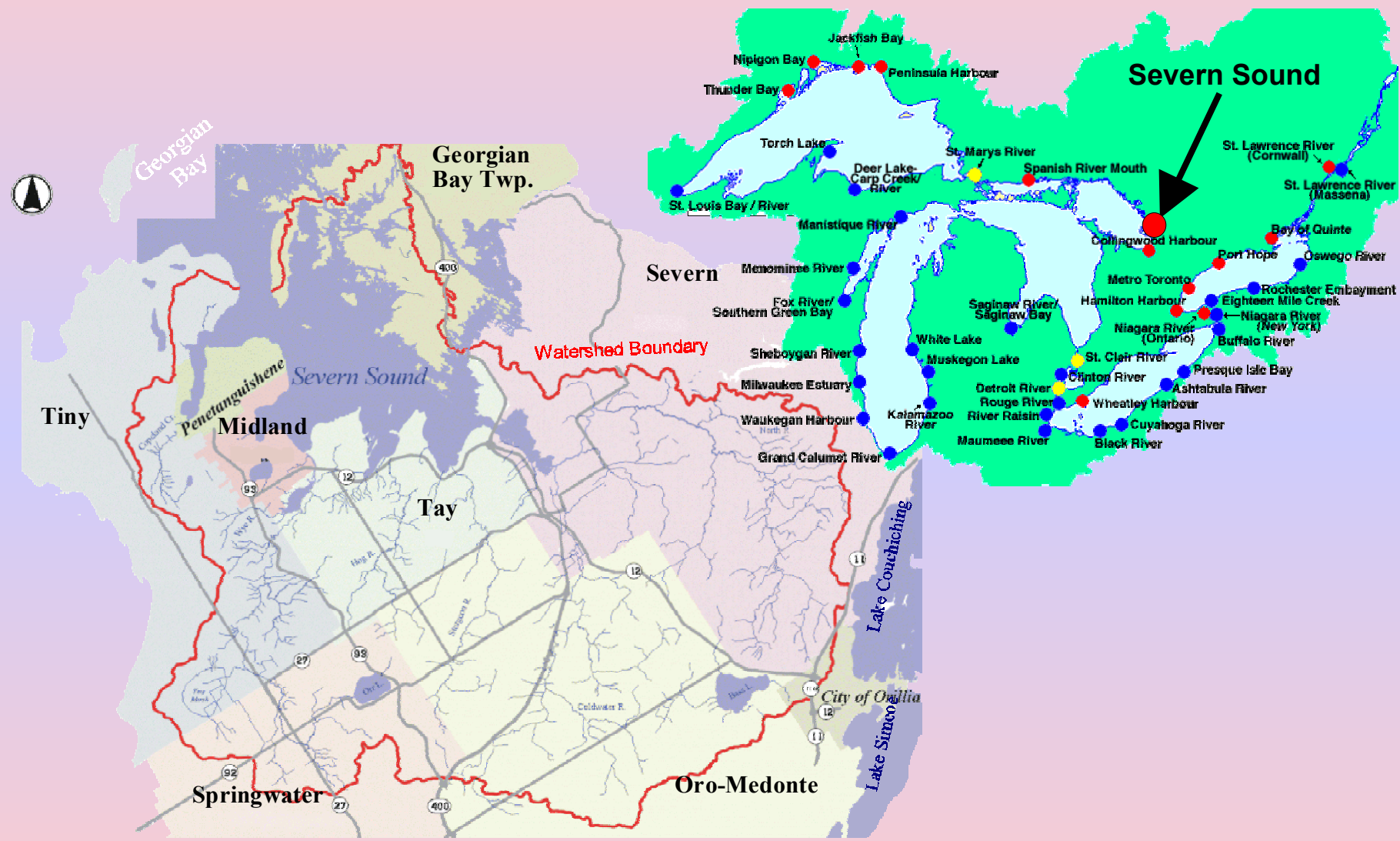
- **Selection of a municipal sector pilot under the Great Lakes Binational Toxics Strategy**
- **Municipal Toxics Management Strategy for Severn Sound**

GLBTS SECTOR SUBGROUP FINDINGS

Short List of Sectors Evaluated

- **Automobile and Related Manufacturing**
- **Secondary Copper Smelting**
- **Government Facilities / Municipalities**
- **Municipal Waste Combustors (MWCs)**
- **Publicly Owned Treatment Works (POTWs)**
- **Utilities**

Severn Sound Area



Preamble

- **Severn Sound Environmental Association (SSEA) is a local partnership agreement of local municipalities in the Severn Sound Area**
- **SSEA in cooperation with Environment Canada through the GLBTS working to protect and sustain the Severn Sound ecosystem resulting from human activity**

Objectives

- **Identify and quantify the storage, release and use of persistent toxic substances in the Severn Sound area as per Great Lakes Binational Toxics Strategy**
- **Summarize ambient contaminant concentrations in various available media**
- **Develop strategy including implementation options, prioritized by substance for future reduction/elimination actions**
- **Conduct consultation amongst Severn Sound municipalities on implementation**

Level I Substances

- Aldrin/dieldrin
- Benzo(a)pyrene {B(a)P}
- Chlordane
- DDT (+DDD+DDE)
- Hexachlorobenzene (HCB)
- Alkyl-lead
- Mercury and mercury compounds
- Mirex
- Octachlorostyrene
- PCBs
- PCDD (Dioxins) and PCDF (Furans)
- Toxaphene

Level I Substances- Ambient Levels in Severn Sound

- Aldrin/dieldrin – ND in biota and sediment
- Benzo(a)pyrene {B(a)P} – near or below detection in sediment
- Chlordane – declining to ND in carp
- DDT (+DDD+DDE) – detection in biota, carp max 200 ng/g
- Hexachlorobenzene (HCB) – near or below det.lim. in carp, ND in sediment
- Alkyl-lead – no data, mean conc. lead in bulk sediment 70 ug/g d.w. in Penetang Bay, 50 ug/g d.w. in open areas of Severn Sound incl. Midland Bay
- Mercury and mercury compounds – detection in biota, sediment, biosolids
- Mirex – detection in biota (gulls eggs), ND in sediment and fish
- Octachlorostyrene – detection in biota (gulls eggs), ND in sediment and fish
- PCBs – levels in carp less than 300 ng/g, generally ND in sediment
- PCDD (Dioxins) and PCDF (Furans) – ND in fish, low to ND in birds eggs, no data on sediment or biosolids
- Toxaphene – ND in biota (fish and birds eggs), no data on sediment

Level II Substances

- Cadmium and cadmium cmpds
- 1,4-dichlorobenzene
- 3,3'-dichlorobenzidine
- Dinitropyrene
- Endrin
- Heptachlor (+Heptachlor epoxide)
- (+Hexachloro-1,3-butadiene)
- Hexachlorocyclohexane
- 4,4'-methylenebis(2-chloroaniline)
- Pentachlorobenzene
- Penetechlorophenol
- Tetrachlorobenzene (1,2,3,4- and 1,2,4,5-)
- Tributyl tin
- PAHs as a group, including but not limited to:
Anthracene, Benzo(a)anthracene, Benzo(g,h,i)perylene,
Perylene, Phenanthrene

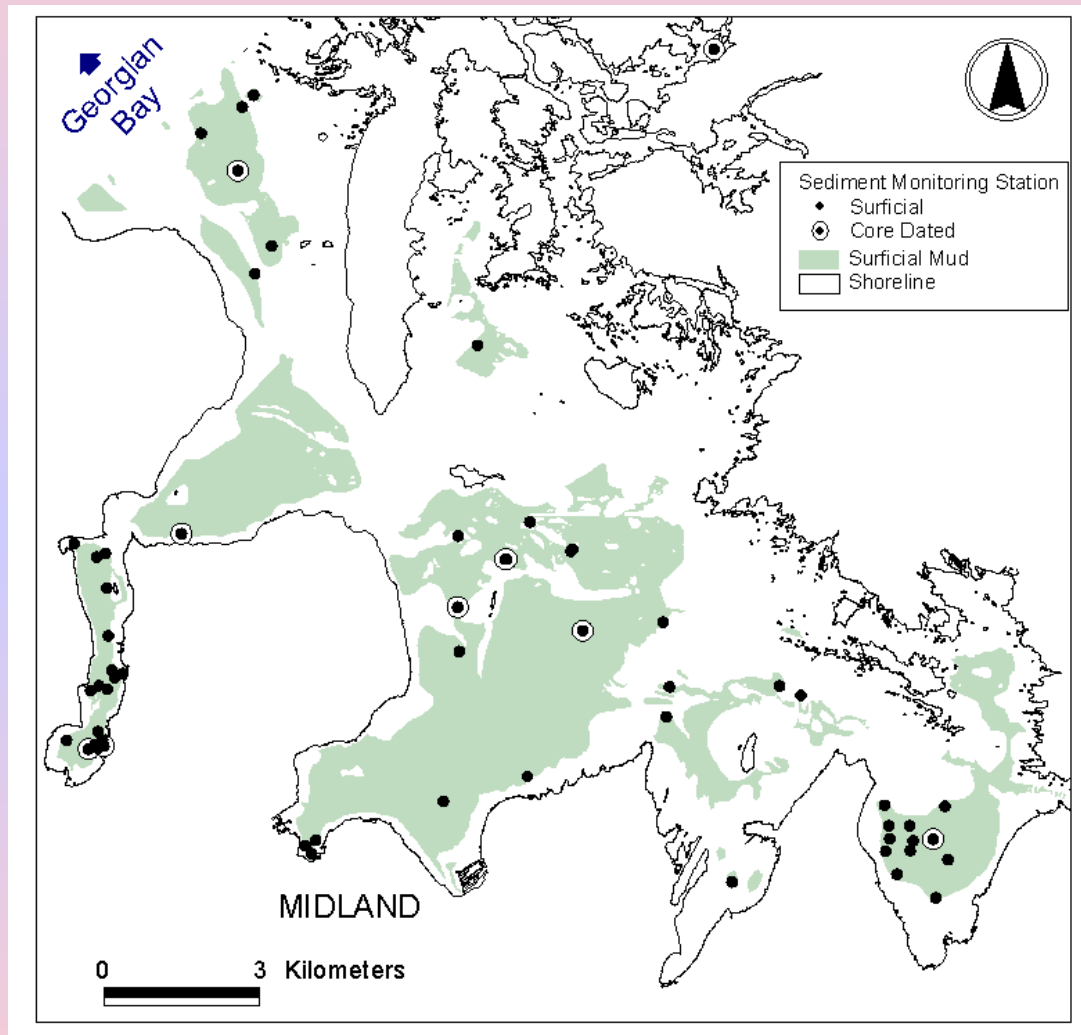
Level II Substances -Ambient Levels in Severn Sound

- **Cadmium and cadmium cmpds - mean conc. cadmium in bulk sediment 1.2 ug/g d.w. in Penetang Bay, 0.45 ug/g d.w. in Sturgeon Bay, 1.4 ug/g d.w. in open areas of Severn Sound incl. Midland Bay**
- **1,4-dichlorobenzene – water samples from marinas (1989 det lim 2 ug/L) not detected**
- **- ND in biota and sediment**
- **Dinitropyrene - near or below detection in sediment**
- **Endrin - ND in biota and sediment**
- **Heptachlor (+Heptachlor epoxide) - ND in biota and sediment**
- **(+Hexachloro-1,3-butadiene) – no data**
- **Hexachlorocyclohexane - ND in biota and sediment**

Level II Substances -Ambient Levels in Severn Sound

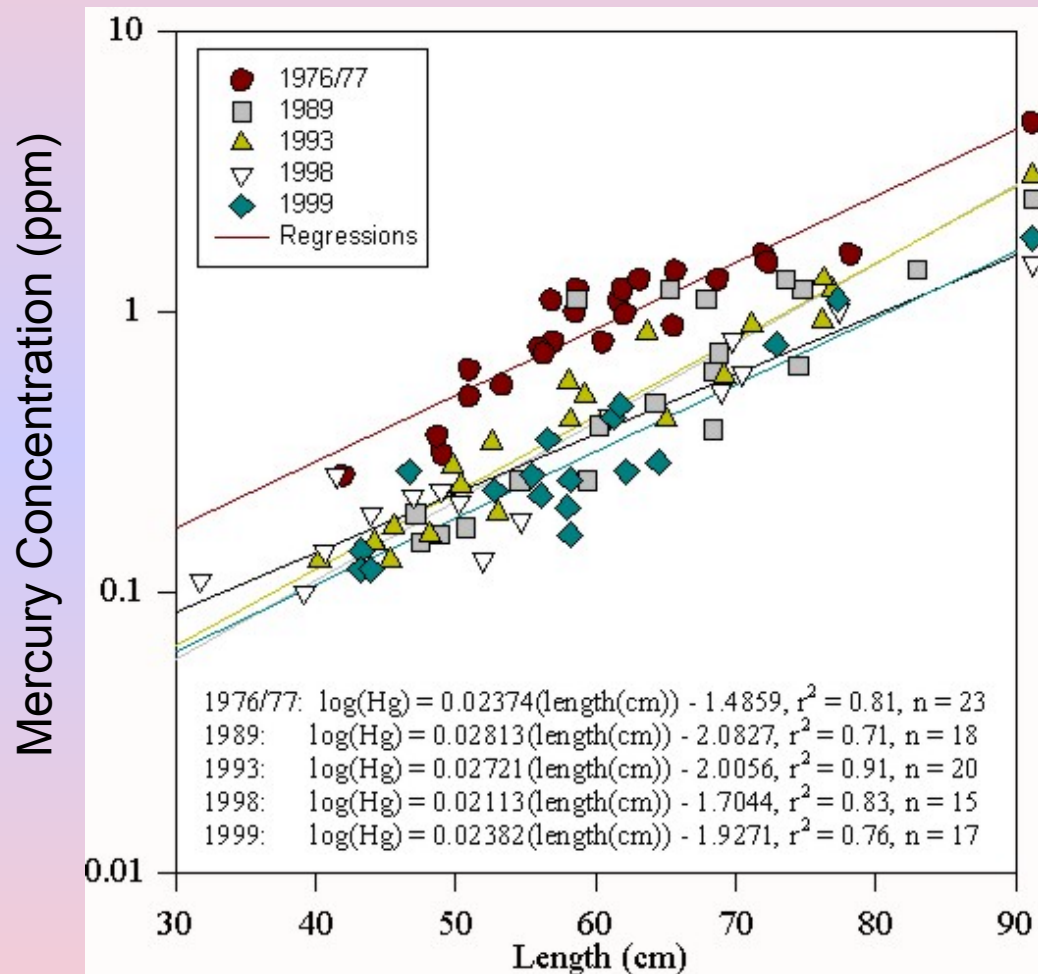
- **4,4'-methylenebis(2-chloroaniline) – no data**
- **Pentachlorobenzene - ND in biota and sediment**
- **Penetechlorophenol - ND in biota and sediment**
- **Tetrachlorobenzene (1,2,3,4- and 1,2,4,5-) - ND in biota and sediment**
- **Tributyl tin – detection in biota (n.pike, YOY spottail shiners), caged mussels, sediment (sampling 1989, 1992)**
- **PAHs as a group, including but not limited to: Anthracene, Benzo(a)anthracene, Benzo(g,h,i)perylene, Perylene, Phenanthrene – near or below detection in sediment**

Deposition Sediment in Severn Sound

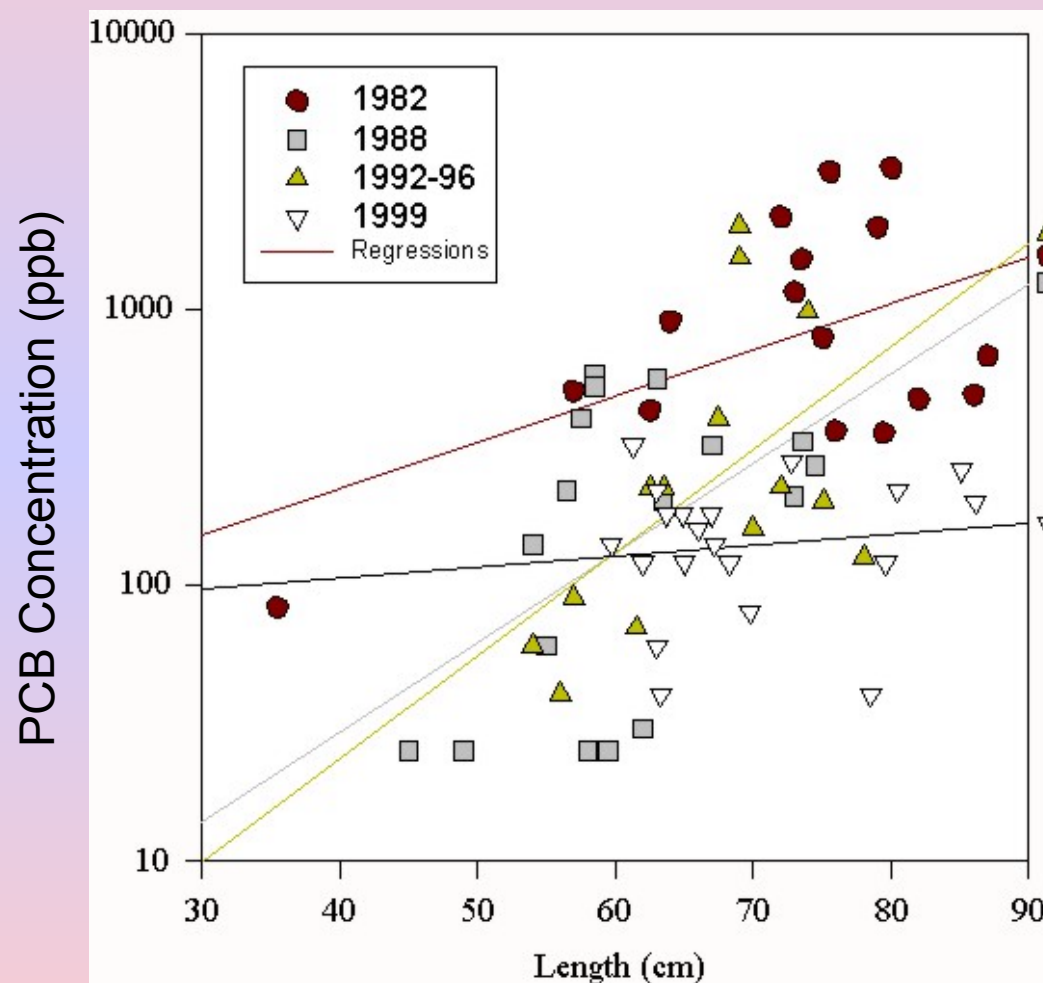


- surficial sediment samples of Hg, Cd, Pb and PCBs, PAHs
- selected areas for chlorinated chemicals, tri-butyl tin

Mercury Concentrations vs. Fish Length for Severn Sound Walleye

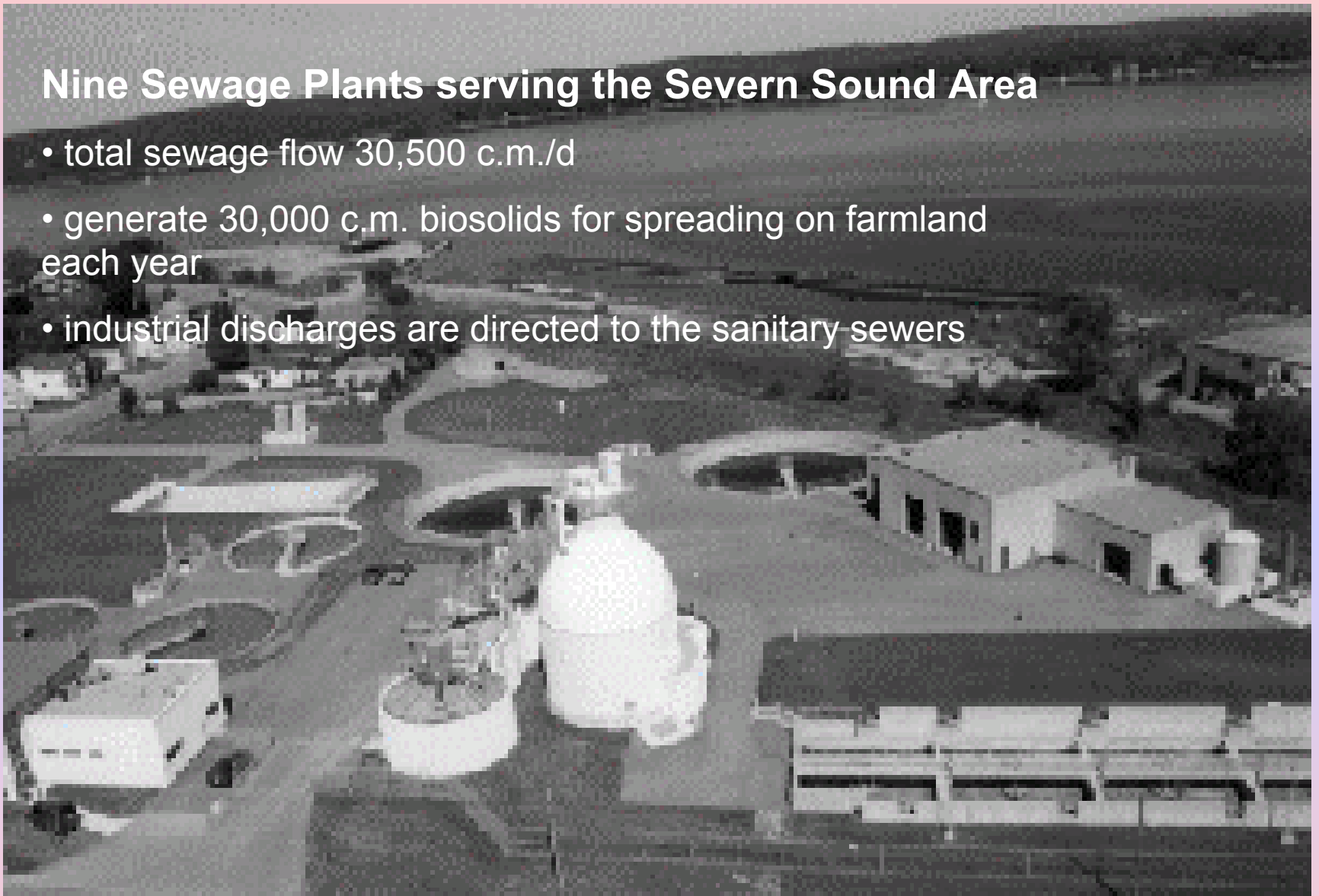


PCB Concentrations vs. Fish Length for Severn Sound Carp



Nine Sewage Plants serving the Severn Sound Area

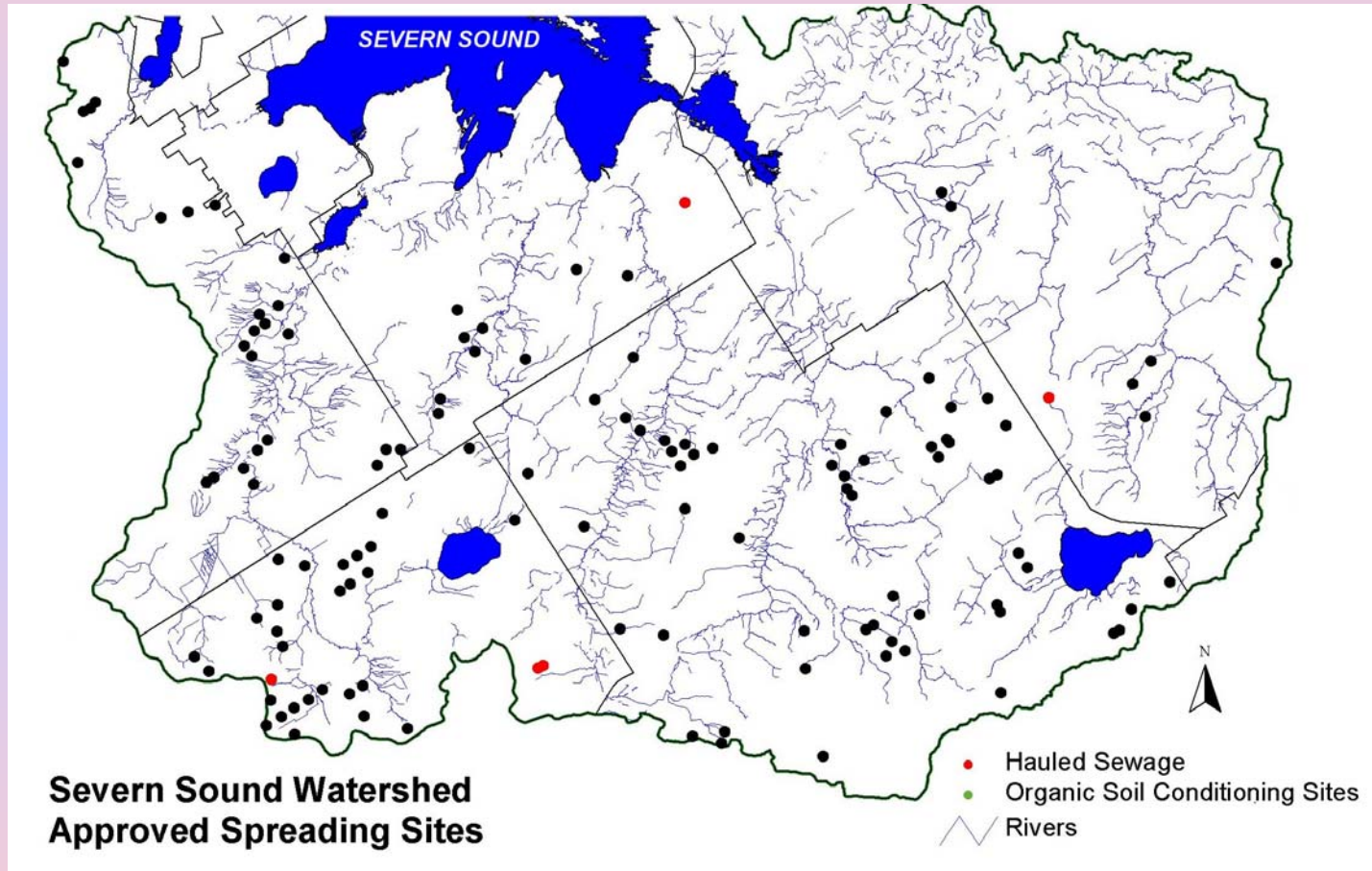
- total sewage flow 30,500 c.m./d
- generate 30,000 c.m. biosolids for spreading on farmland each year
- industrial discharges are directed to the sanitary sewers



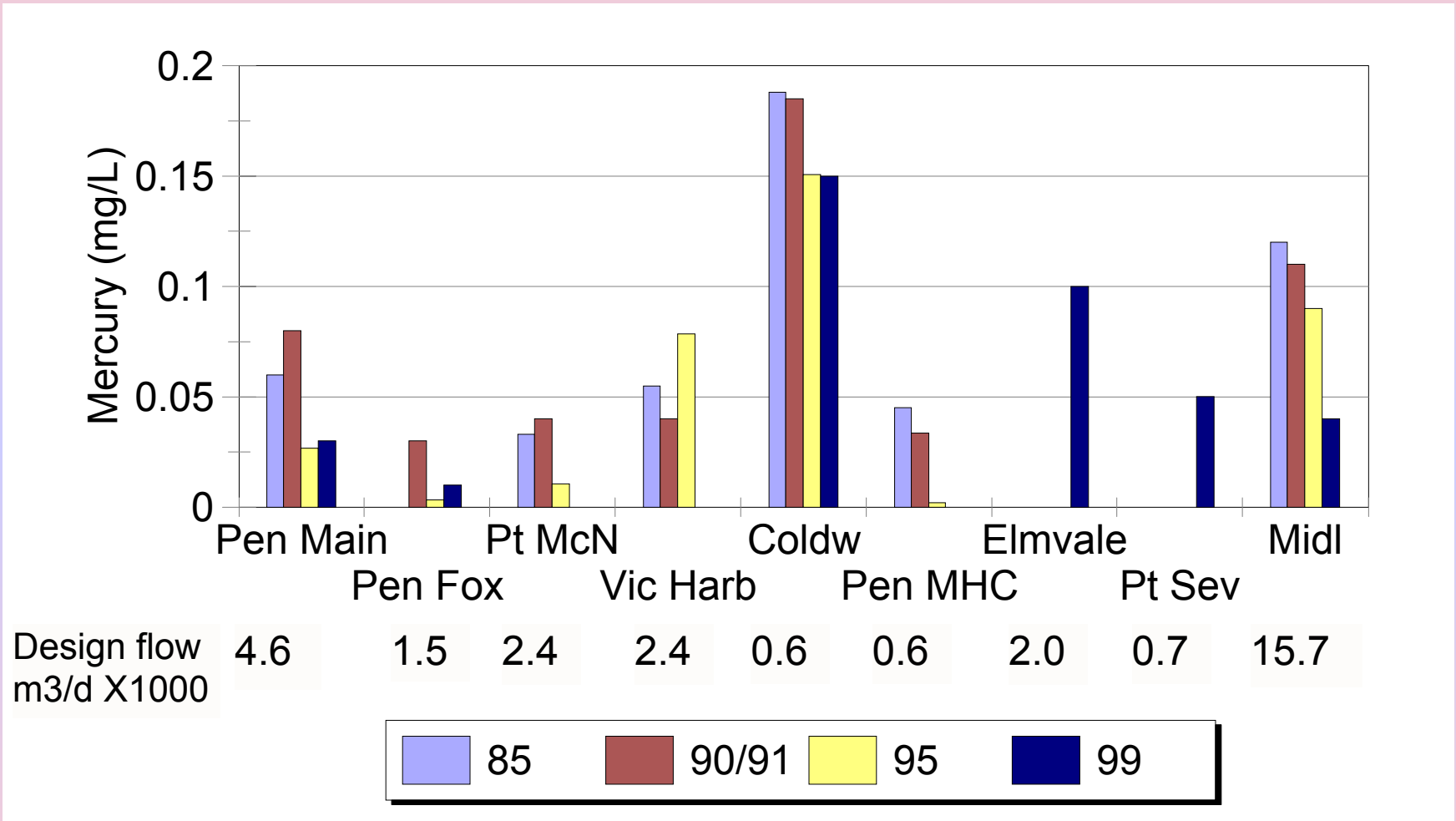
THE GREAT LAKES BINATIONAL TOXICS STRATEGY

Biosolids spreading sites in Severn Sound

- 117 approved sites + 5 Hauled waste sites
- total approved capacity = 275,000 c.m.

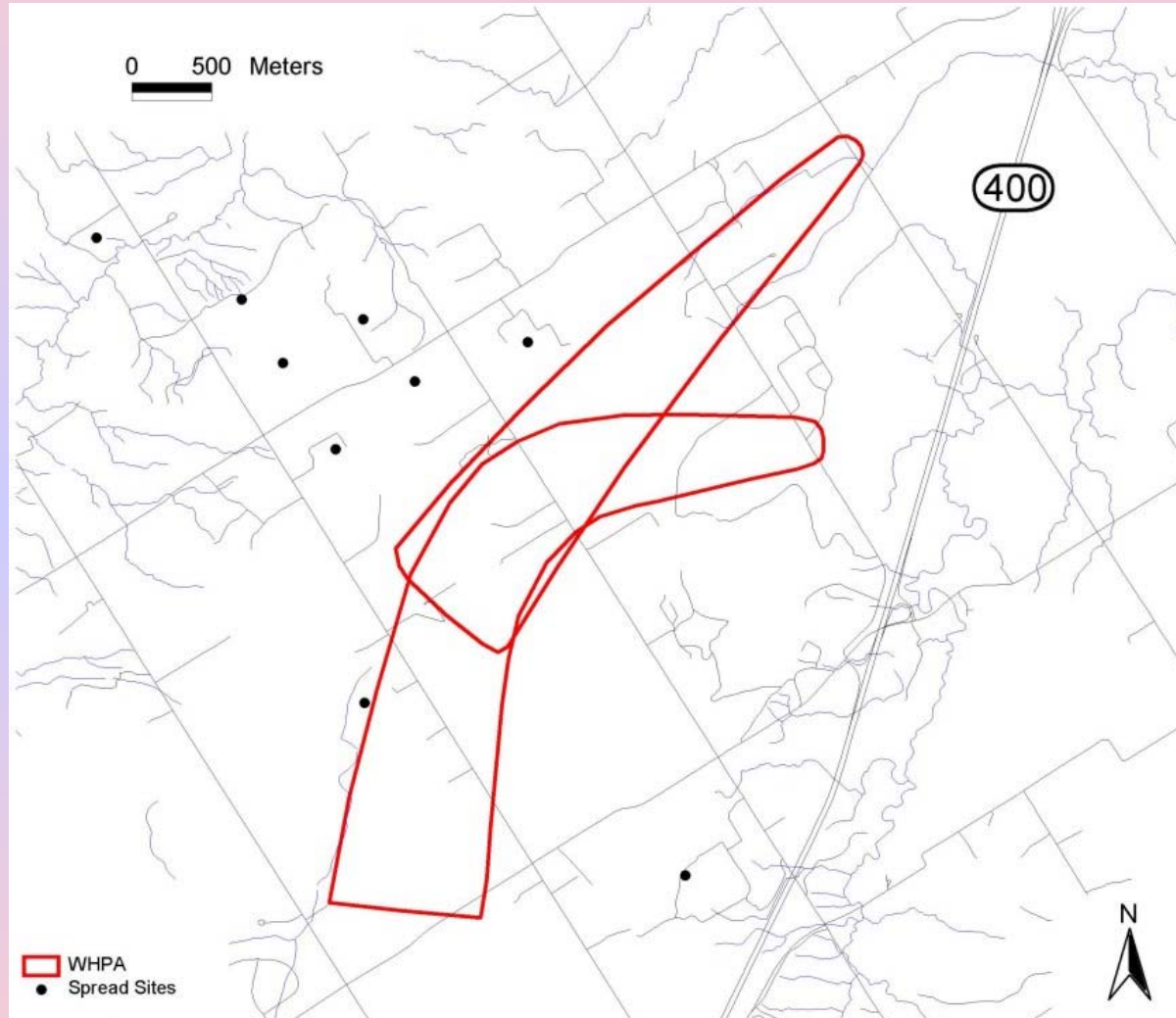


Biosolids quality of STPs in Severn Sound - Mercury



THE GREAT LAKES BINATIONAL TOXICS STRATEGY

Municipal wellhead 25-year capture zones for 2 small communities in Severn Sound



Progress on municipal strategy – Project Activities

- **Municipal staff are being contacted for information concerning:**
 - ◆ **Processes using or producing toxic substances that could be discharged or spilled to Severn Sound are being documented**
 - ◆ **Pollution Prevention processes dealing with toxic substances**
 - ◆ **In-storage use of toxic substances and programs to change-out or discontinue use of these substances**
 - ◆ **Waste reduction, recycling, treatment processes**
 - ◆ **Levels of toxic substances in sewers and biosolids**
- **North Simcoe Municipal Groundwater Study including contaminants inventory expected by June 03**
- **Provincial contaminants inventories and pollution prevention information being accessed for the area**
- **Preliminary mapping of municipal facilities is underway**

Great Lakes Binational Toxics Strategy on the Web:

www.binational.net



“....toward the goal of virtual elimination of persistent toxic substances resulting from human activity, particularly those which bioaccumulate, from the Great Lakes Basin, so as to protect and ensure the health and integrity of the Great Lakes ecosystem.”