

# 2008 Fisheries Resource Study, Woodens River Watershed, Nova Scotia



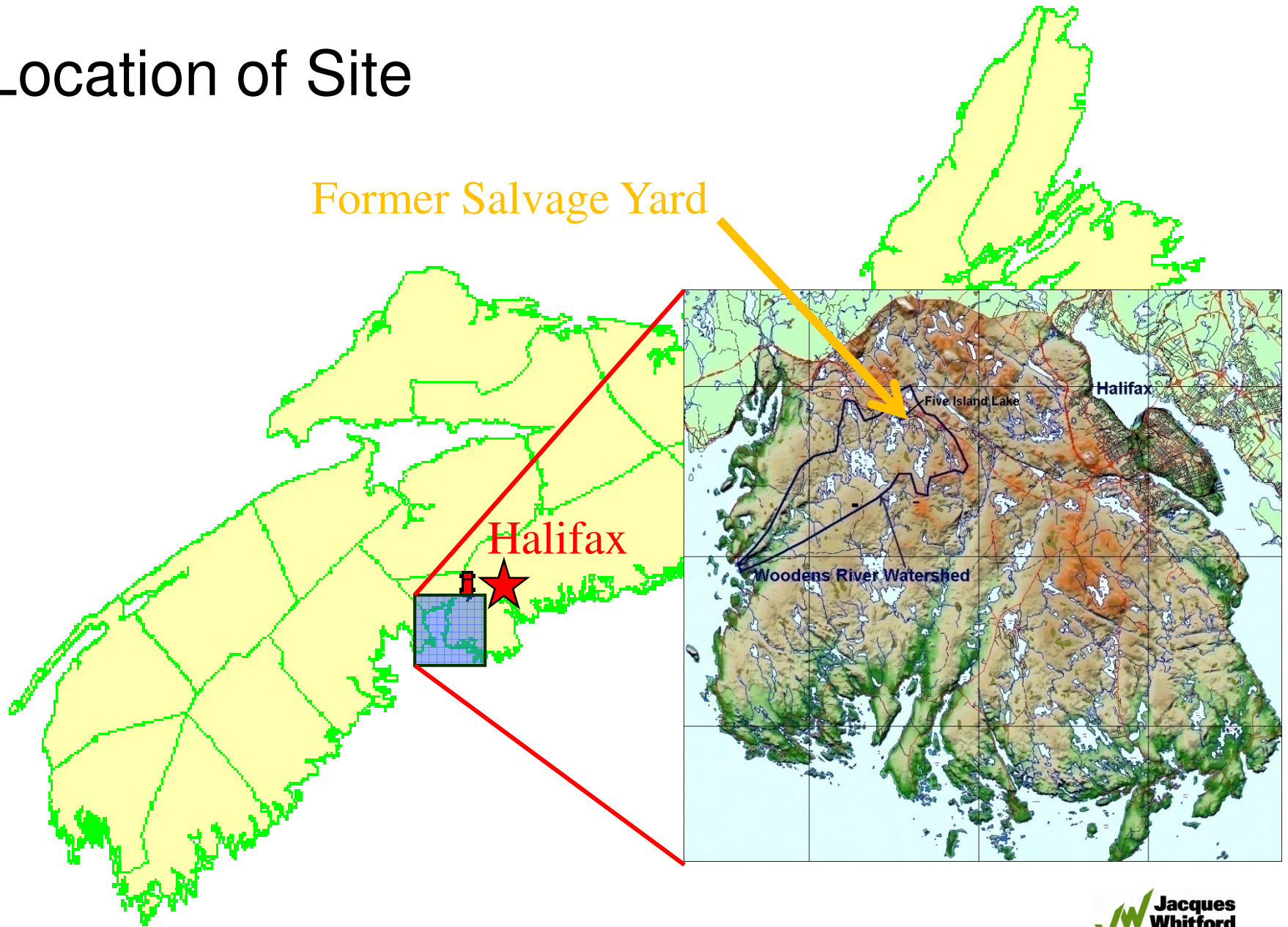
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January 27, 2009



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# Location of Site



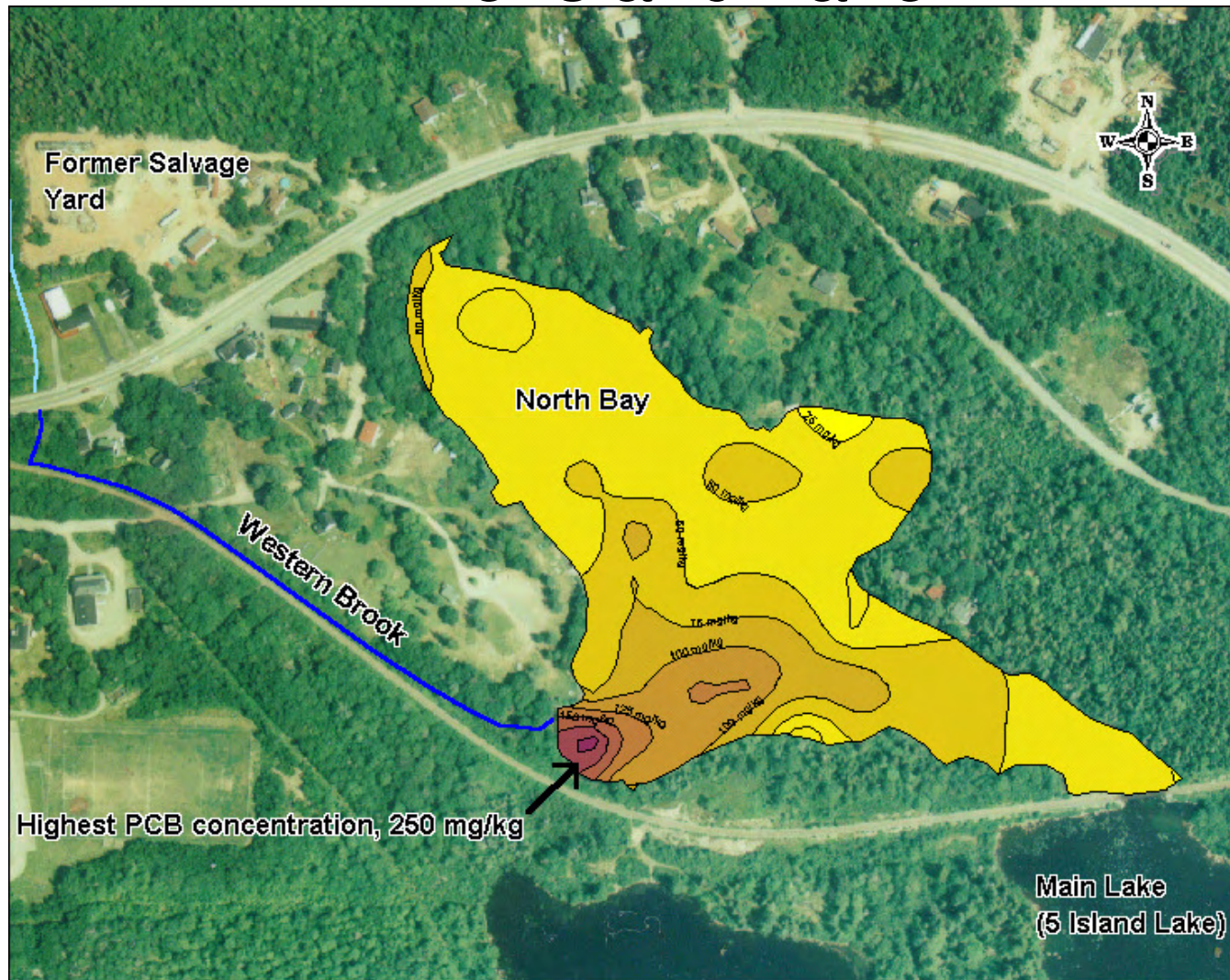
# Salvage Yard History

- Former scrap yard
- Received electrical components including transformers
- Operated a “small-scale” smelter



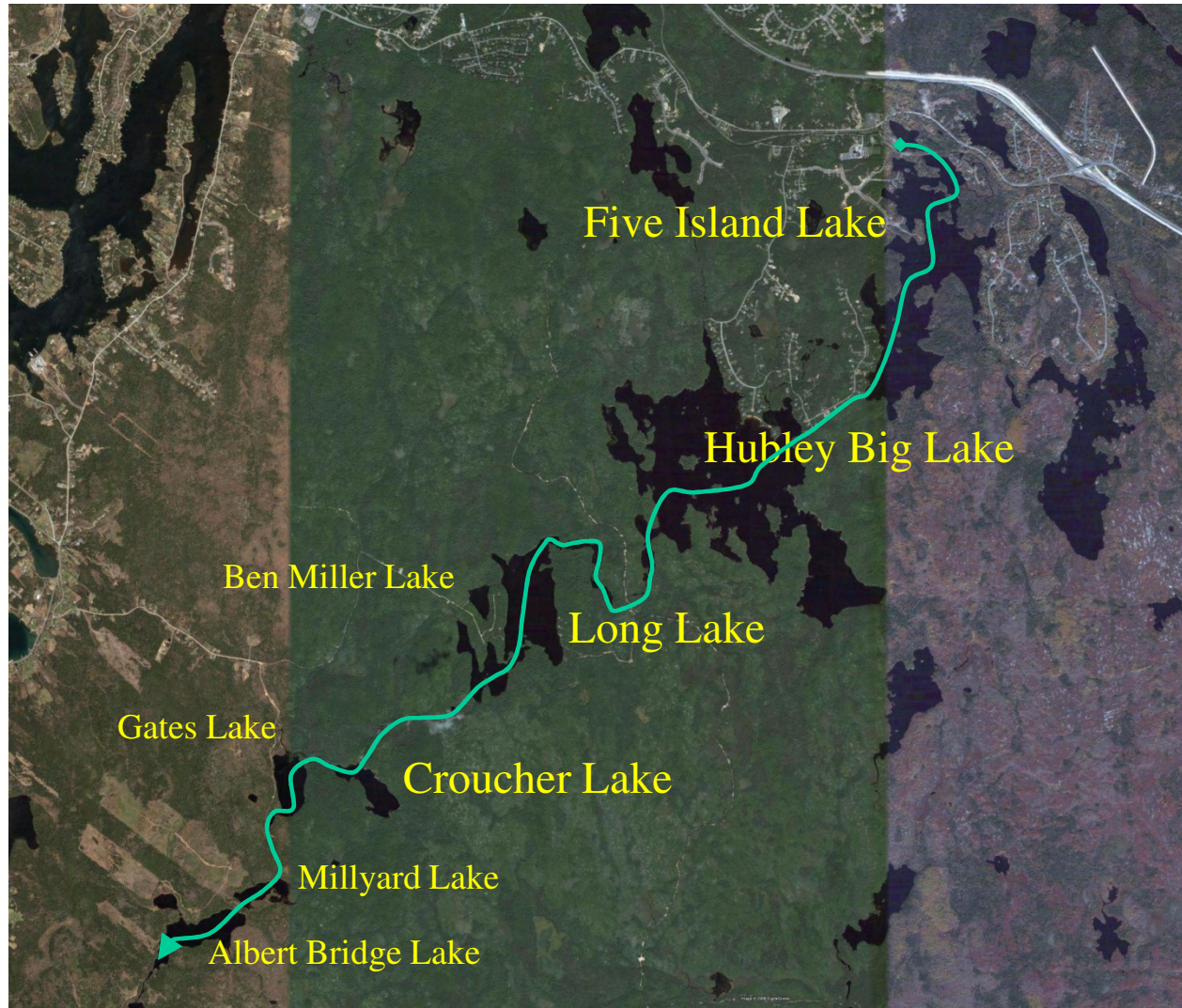


# PCB Distribution in North Bay, Five Island Lake





# Woodens River Watershed

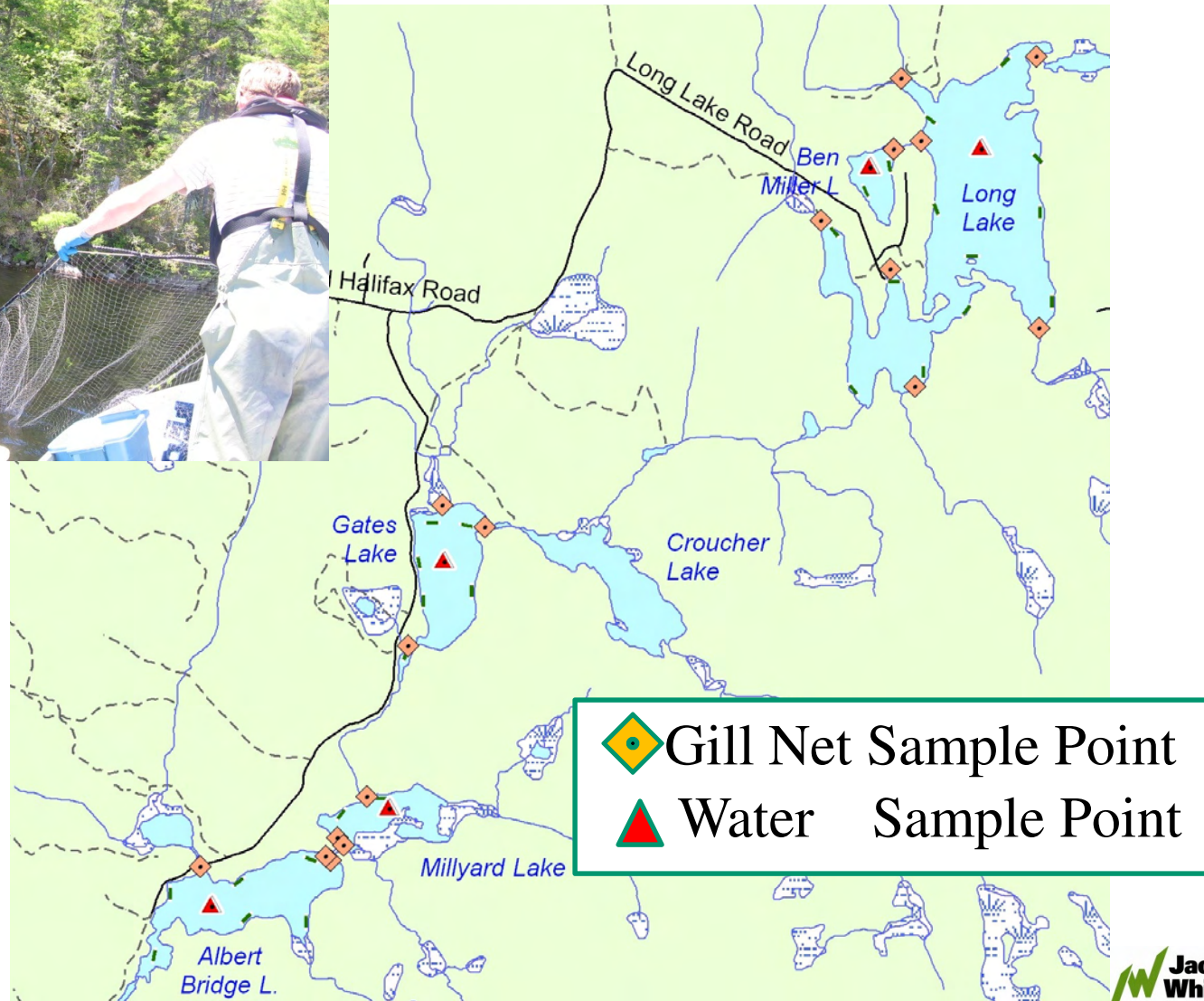




# Typical Lake/stream Conditions and Access



# Location Of Samples





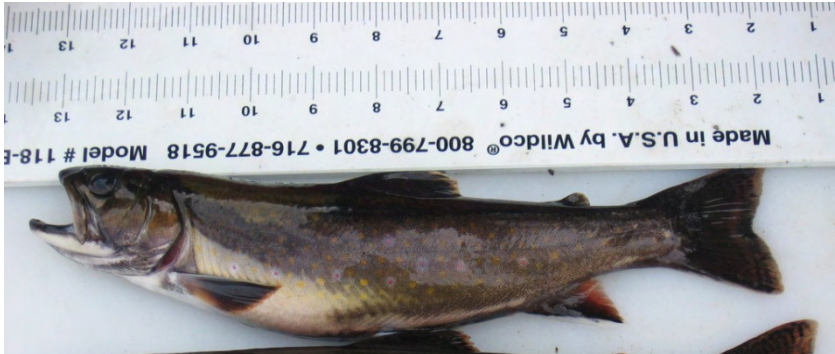
# Summary of Sample Set

Lake	Gill Net	Minnow Trap	Samples Submitted for PCB Analysis	
			Game Fish Tissue	Small-bodied Whole Fish Composite
Long Lake	16	6	10	1
Ben Miller Lake	2	1	6	1
Gates Lake	4	2	2	1
Millyard Lake	3	3	0 <sup>1.</sup>	1
Albert Bridge Lake	6	3	2	1

1. No game fish tissue samples were submitted for PCB analysis from Millyard Lake, no fish of size likely to be consumed by humans were caught in this lake.



# Typical Fish Caught in Program



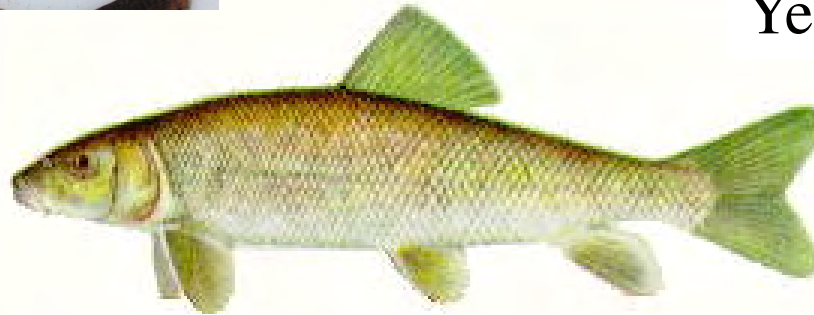
Brook Trout



Yellow Perch



Gaspereau



White Sucker



Golden Shiner



Banded Killfish

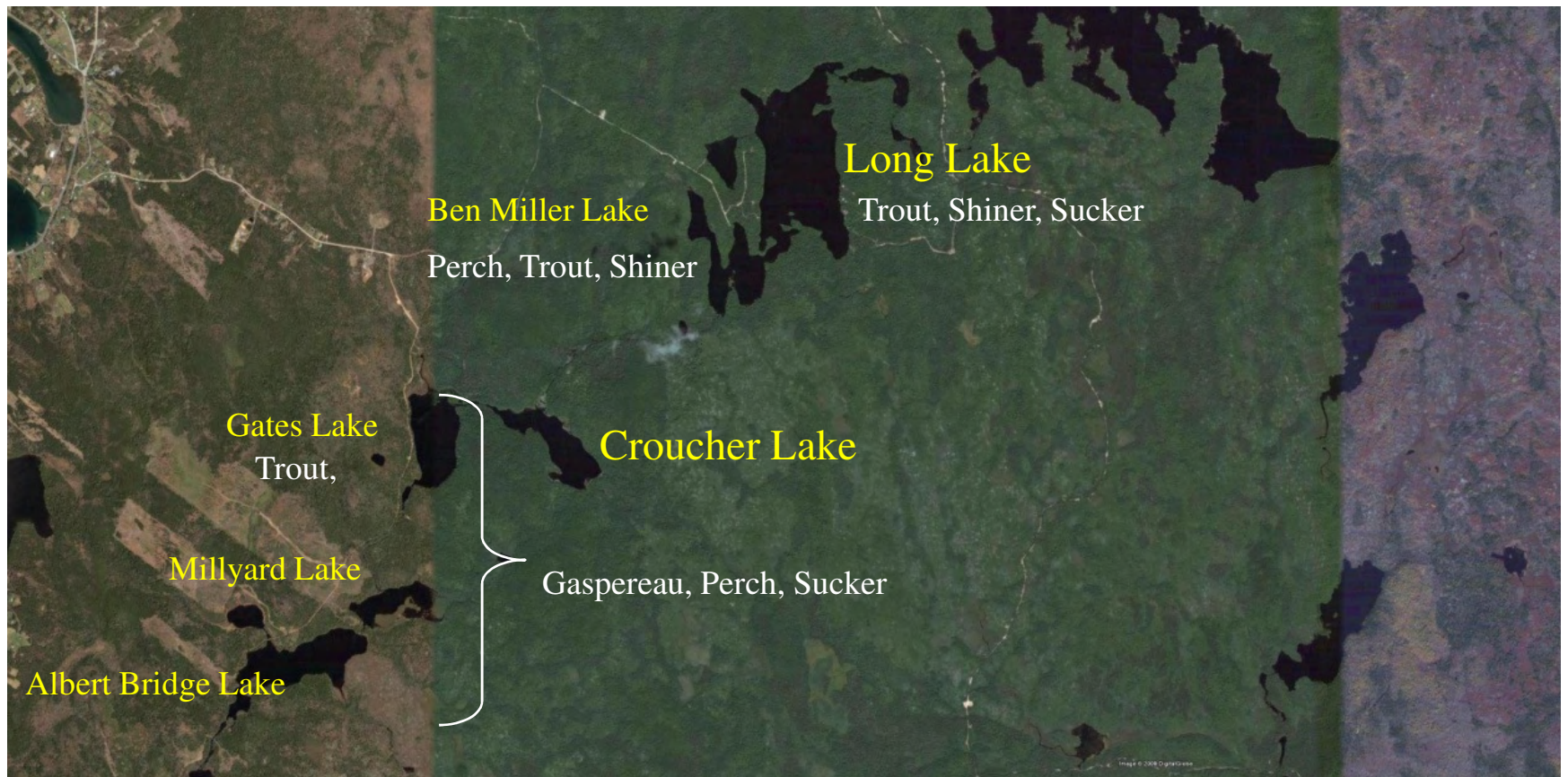
# Measurements and Field Activities

- Target fish species
  - Brook trout, white perch, white sucker, yellow perch, minnow species
- Measurements
  - Weight
  - Total or fork length
  - Sex
  - Age (scale samples)





# Fish Species Caught in Lakes



# Guidance - Human Consumption

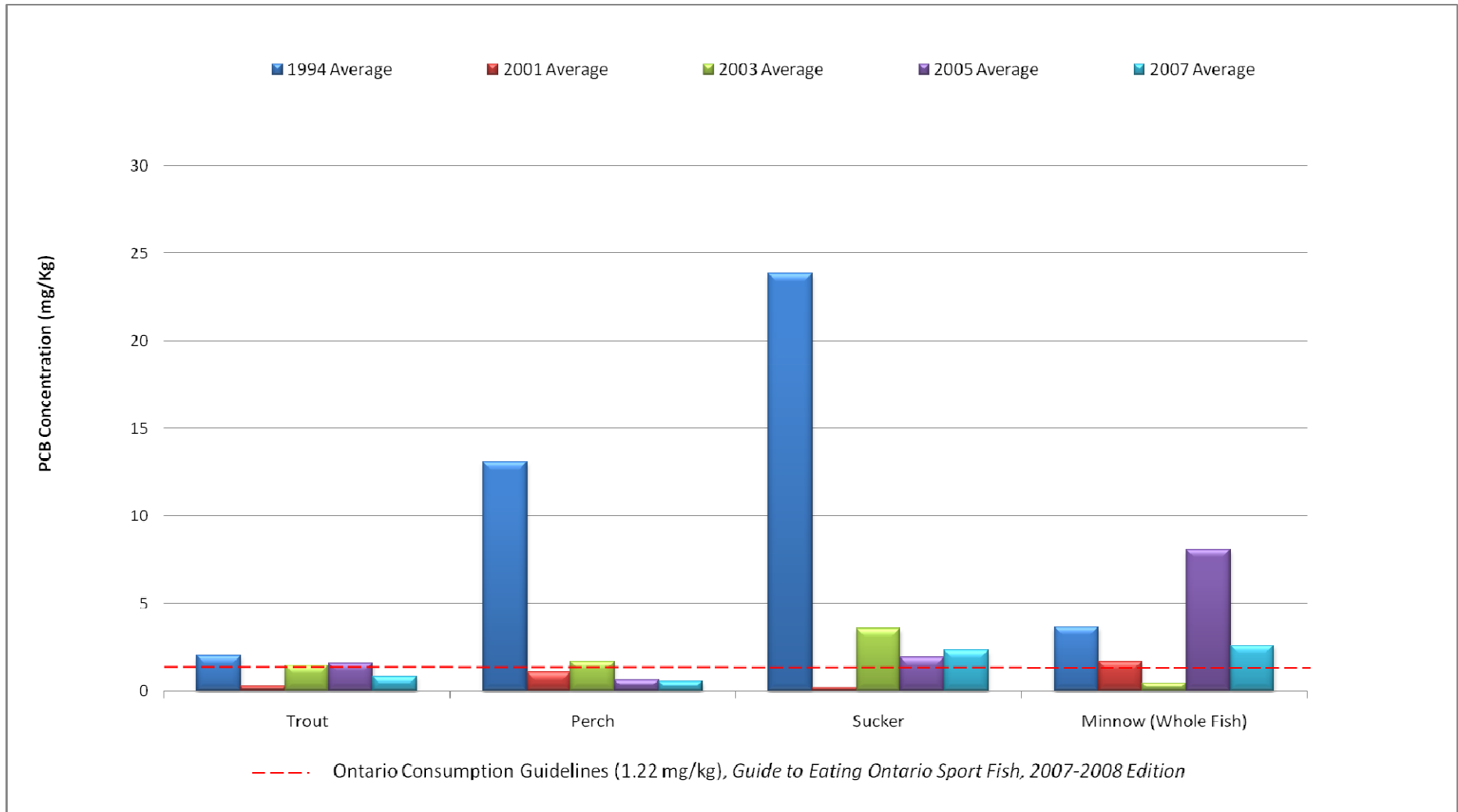
- Ontario Ministry of Environment's (OMOE)  
Guide to Eating Ontario Sportfish (2007 Edition)
  - Lowest consumption Restriction Guideline (0.153 mg/kg fresh weight; no more than 8 meals per month)
  - Total Restriction Guideline (1.22 mg/kg fresh weight; consumption not recommended at all)
  - Pregnant women and children under 15 years of age should eat fewer meals of fish
  - Sport fish consumption should be reduced if you regularly consume commercially purchased fish



# Guidance – Wildlife Consumption

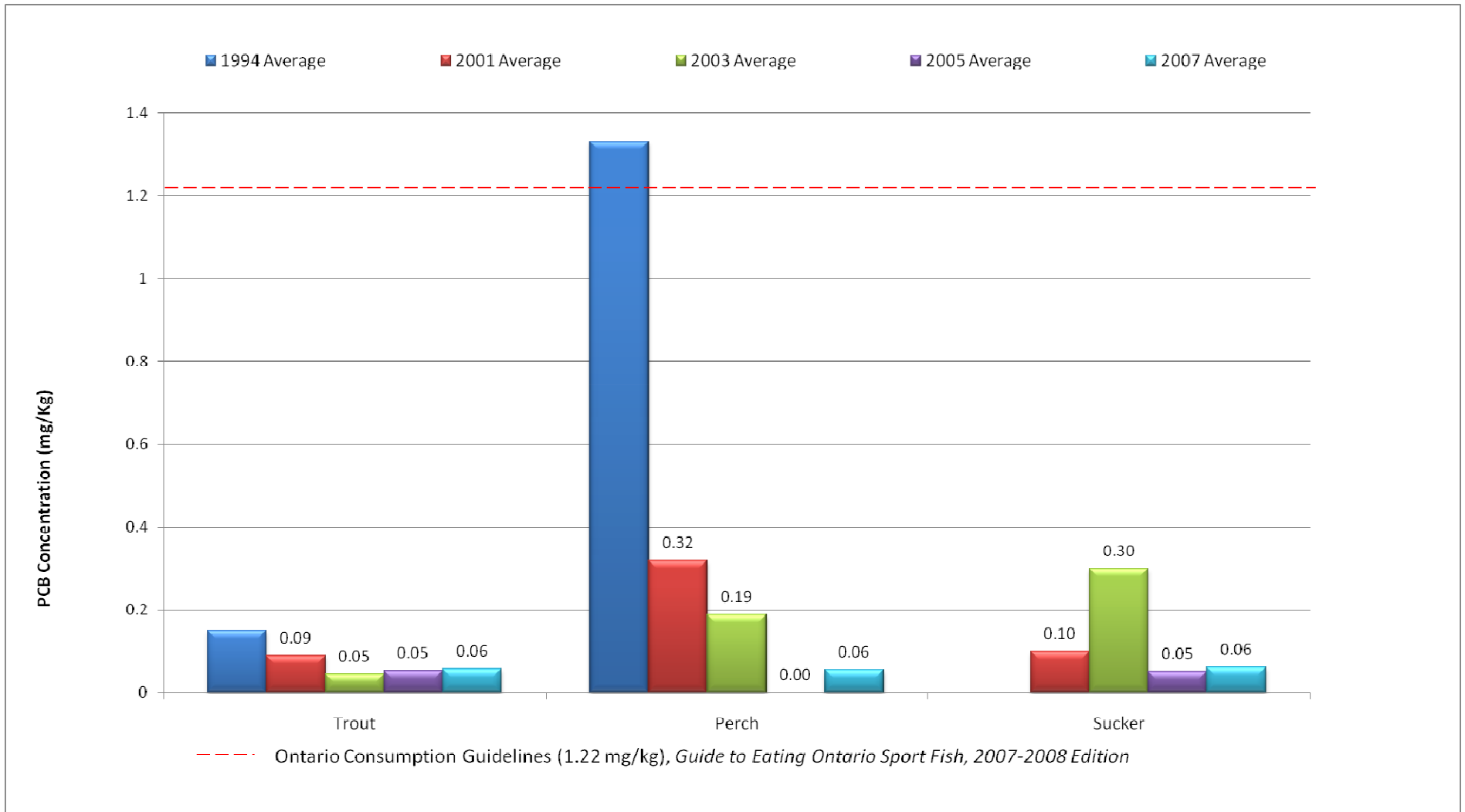
- USEPA's Dietary Exposure of Mink to Fish from the Housatonic River: Effects on Reproduction and Survival (June 10, 2003)
  - PCB in fish should not exceed 0.96 mg/kg fresh weight in order to protect wildlife consumers of fish

# Average PCB Concentration in Fish Tissue Five Island Lake

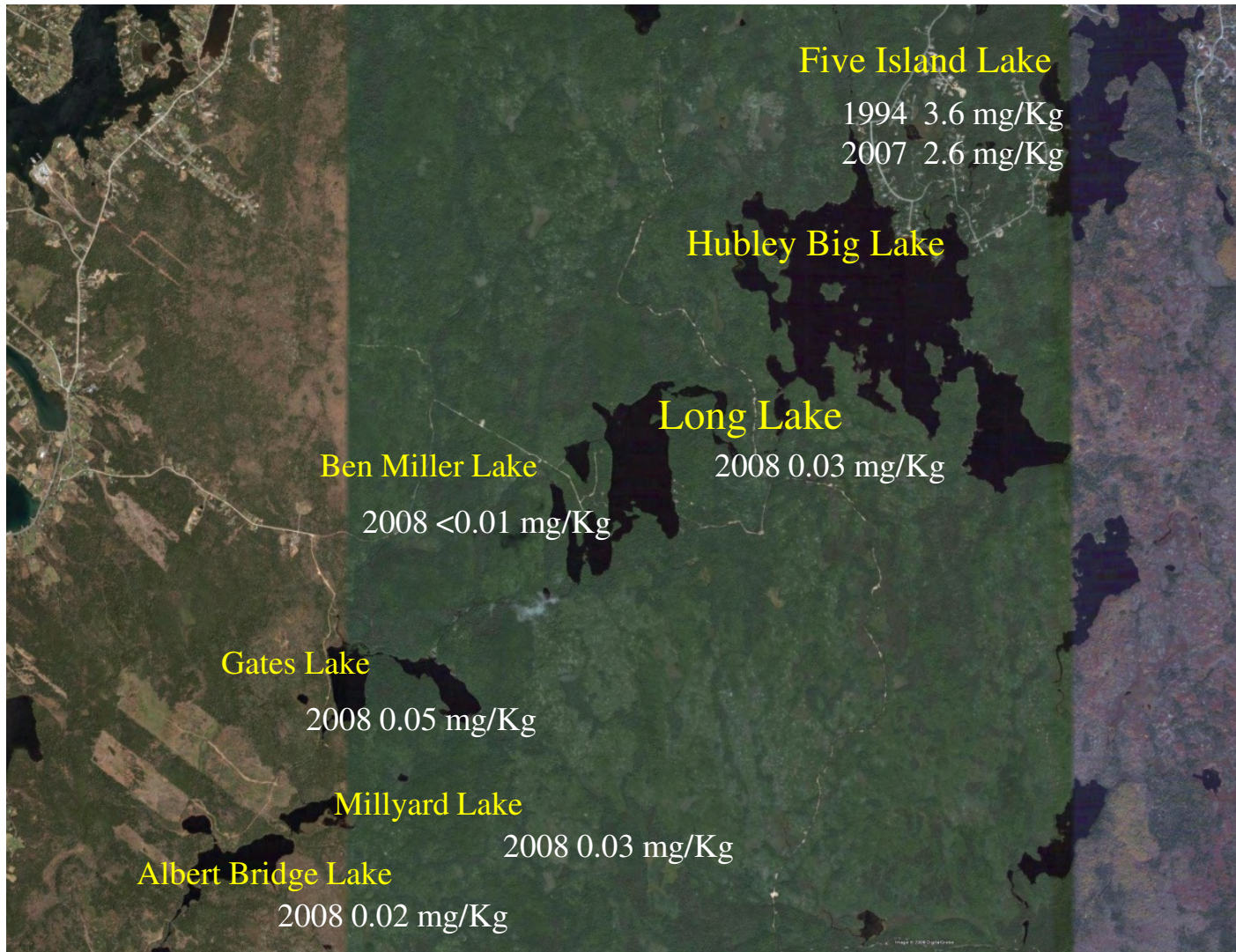




# Average PCB Concentration in Fish Tissue Hubley Big Lake

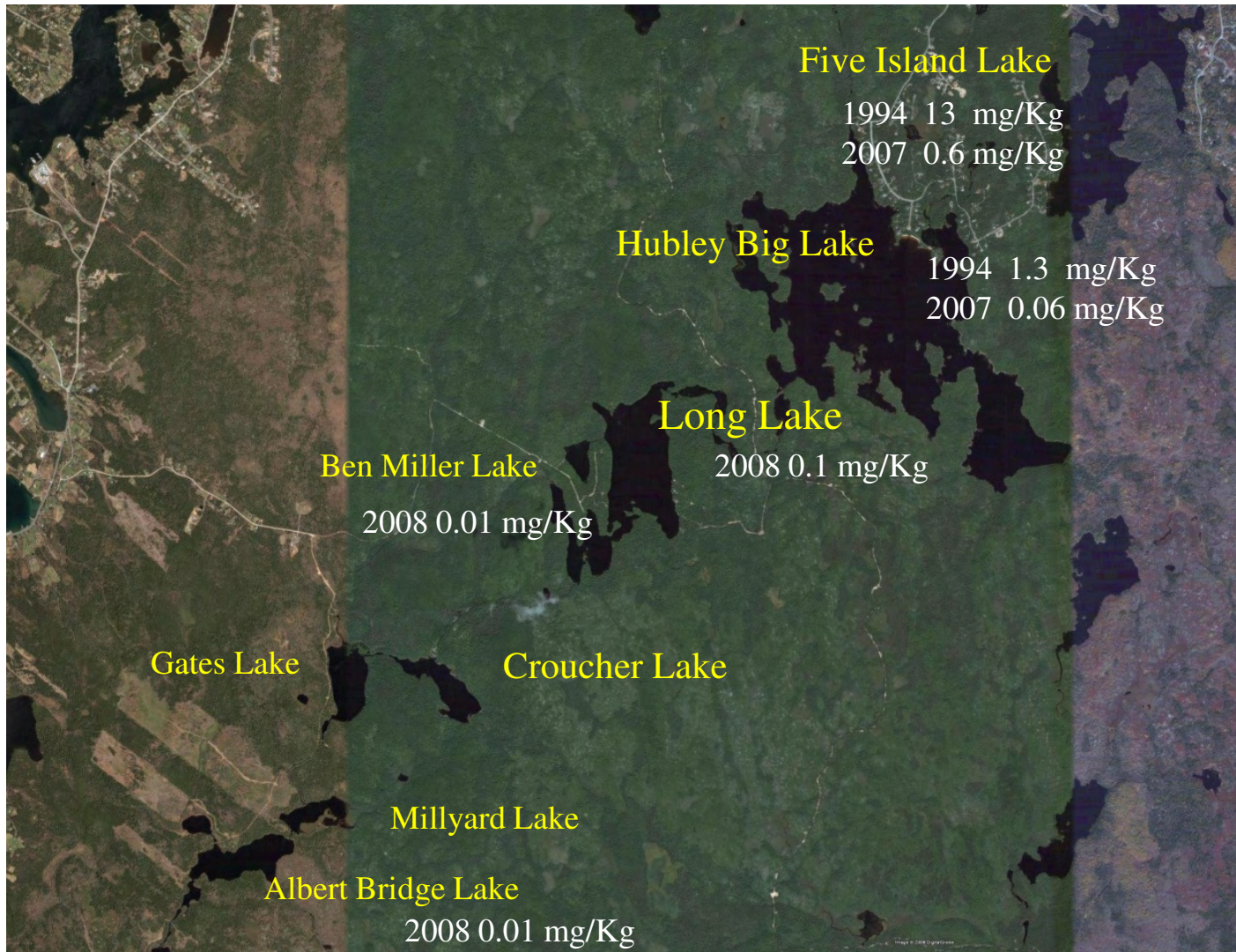


# Average PCB In Minnows, 2007-2008



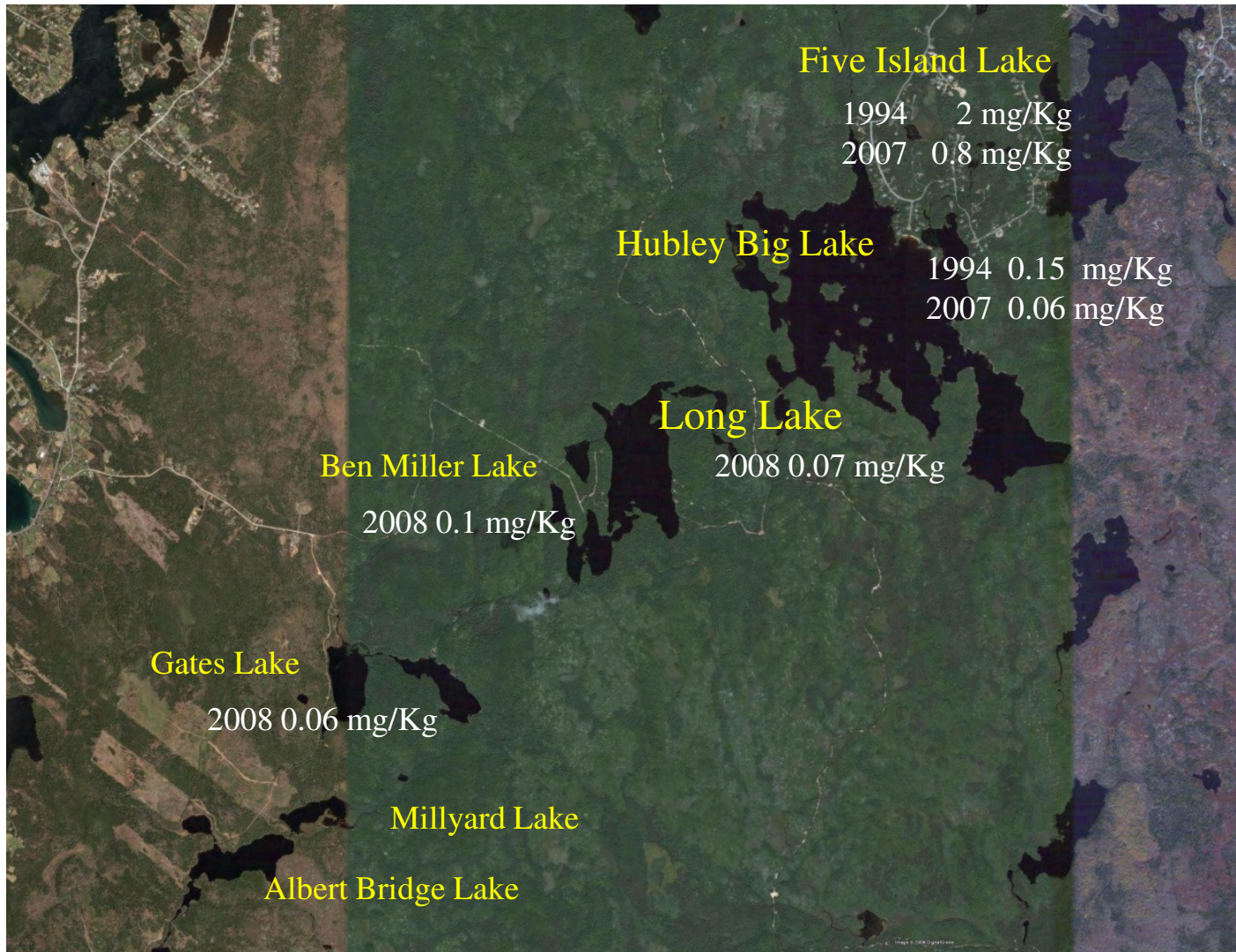


# Average PCB In Perch, 2007-2008





# Average PCB In Trout, 2007-2008



# Typical Lake Water Quality Results

Lake	pH	Specific Conductivity ( $\mu\text{S}/\text{cm}$ )	Temperature ( $^{\circ}\text{C}$ )	Dissolved Oxygen	
				(%)	(mg/L)
Ben Miller Lake	5.63	39	17.85	115.3	10.99
Long Lake	4.9	113	17.31	107.2	10.24
Gates Lake	4.72	93	15.90	111.7	11.05
Millyard Lake	4.76	92	16.58	106.8	10.43
Albert Bridge Lake	4.8	90	17.20	105.8	10.19

# Conclusions: Lakewater pH and Dissolved Oxygen

- Dissolved oxygen in lakes sampled was supportive of the freshwater fish species.
- pH in Long, Gates, Millyard and Albert Bridge lakes was low (pH range 4.72 to 4.9); Ben Miller Lake was significantly better.
  - The observed pH range is an appreciable stressor for fish. Brook trout often have difficulty reproducing at pH less than 5.
  - The pH in Ben Miller Lake (pH 5.63) was marginally acceptable for brook trout.
- Many of these fish populations are likely under chronic stress due to low pH.



# Conclusions: Fish Catch Distribution

- The abundance and distribution of fish caught during the study was generally consistent with the lake size and water quality.
  - Brook trout: only caught in the most upstream lakes;
  - Golden shiner: only caught in the two most upstream lakes;
  - White Perch: only caught in Ben Miller Lake; and
  - Gaspereau: anadromous fish, only caught in the 3 most downstream lakes.

# Conclusions: PCB and Consumption of Fish in the Lower Woodens River Watershed

- PCBs were detected but below OMOE and USEPA guidelines
- Some game fish samples from Ben Miller Lake and Albert Bridge Lake, had detectable concentrations of PCBs.
- PCBs were detected but below USEPA guidelines, for small whole-bodied composite fish samples from Long, Gates, Millyard and Albert Bridge lakes (had non-detectable PCB concentrations Albert Bridge Lake).
- At this time, there is no significant risk due to PCB consumption of fish (human or wildlife receptors) from Long Lake, Ben Miller Lake, Gates Lake, Millyard Lake or Albert Bridge Lake.

# Recommendations

- Based 2008 data
  - angling restrictions are not required to protect anglers from consumption of PCBs in fish tissue from Long Lake, Ben Miller Lake, Gates Lake, Millyard Lake or Albert Bridge Lake,.
- Lake pH
  - Several lakes in the study area had pH sufficiently low to be an appreciable stressor for fish, particularly trout.
  - Inland Fisheries & Aquiculture should assemble and review any historic data respecting pH and general water chemistry for the watershed.
  - If data are not available, a sampling/monitoring program should be established to evaluate pH trends along with other key indicator parameters (temperature, dissolved oxygen, and general water chemistry).
  - Data should be compiled and reviewed by Inland Fisheries & Aquiculture to support developing a fish stock management strategy for this lake system.