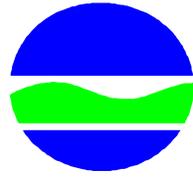


# Mercury in Fish from New York State Lakes



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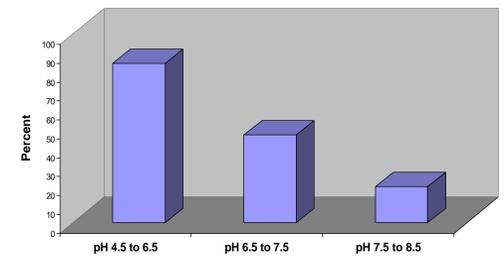
## ABSTRACT

A 4-year study surveyed 131 lakes across New York State beginning in 2003 to improve our understanding of mercury and gather information from previously untested waters. Our study focused on largemouth and smallmouth bass, walleye and yellow perch, common piscivorous fish shown to accumulate high mercury concentrations and species important to local fisheries. Fish from Adirondack and Catskill Forest Preserve lakes generally had higher mercury concentrations than those from lakes in other areas of the state. Variability between nearby individual lakes was observed, and could be due to differences in water chemistry, lake productivity or the abundance of wetlands in the watershed. We found the following factors were related to mercury bioaccumulation: fish length, lake pH, specific conductivity, chlorophyll-a, mercury concentration in the water, presence of an outlet dam and amount of contiguous wetlands. We found little or no relationship with dissolved organic carbon. Data from 12 Adirondack lakes were used to evaluate mercury trends in fish over time, and indicated an average decline of 16% in yellow perch mercury concentration over the past 15 years. Project data were used by the New York State Department of Health (NYSDOH) to issue new fish consumption advisories on numerous lakes and a new region-wide advisory for the Adirondack and Catskill Parks.

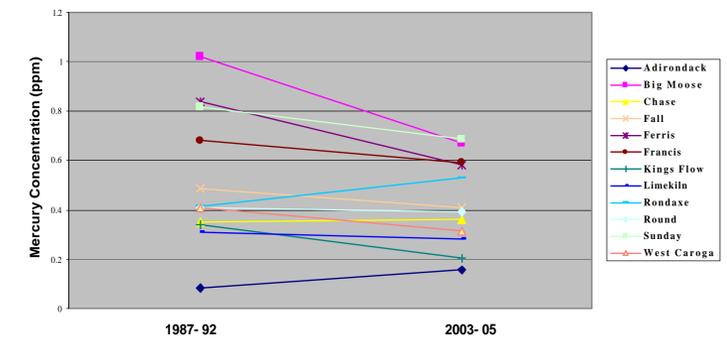
## RESULTS

- A total of 2605 individual fish from 131 lakes were analyzed for total mercury.
- Fish from lakes in the Adirondack and Catskill Park regions had higher mercury concentrations than fish from lakes in other regions.
- The fish mercury data for each lake were used to calculate the mercury concentration in a standard sized fish (e.g. 9" yellow perch, YP) from that lake. These were then used to make among-lake comparisons.
- Variables associated with high mercury concentrations in fish include:
  - Biological – predatory fish and large size (old age);
  - Chemical/Physical - acidic water, low chlorophyll-a (low productivity), presence of contiguous wetlands, presence of an outlet dam.
- Limited trend data indicated an average decline of 16% in yellow perch mercury levels over the past 15 years from 12 Adirondack lakes.

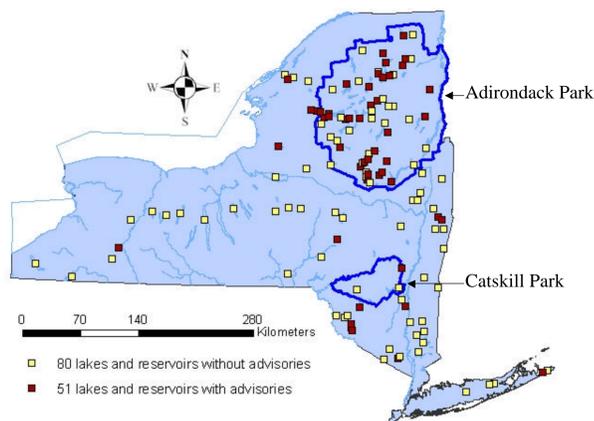
Percent of Lakes in Each Category with 9 inch Yellow Perch > 0.3 ppm Mercury



Change in Mercury in 9 inch Yellow Perch



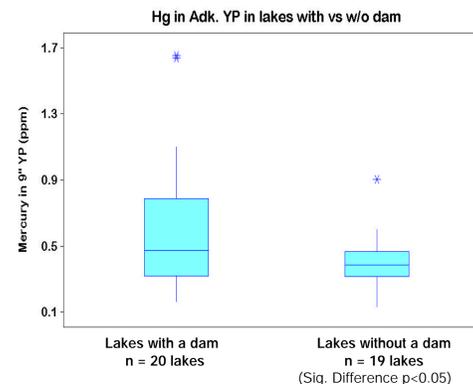
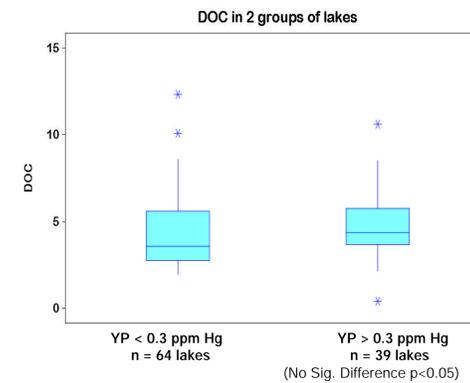
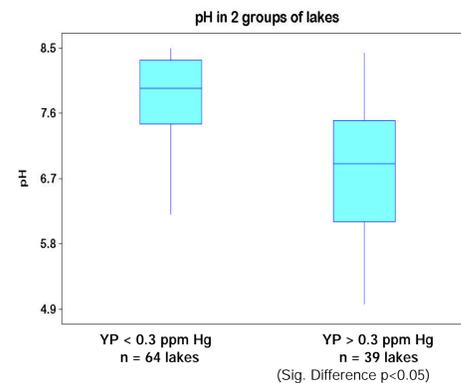
Locations and NYSDOH Consumption Advisories for Project Lakes



Species	Mercury Concentrations (ppm)			Mean
	# fish	# lakes	Range	
Walleye	260	26	0.11 to 3.60	0.66
Smallmouth Bass	590	65	0.04 to 3.32	0.63
Largemouth Bass	535	59	0.02 to 2.13	0.50
Yellow Perch	1100	103	0.01 to 3.24	0.35

## PROJECT OVERVIEW

- We conducted a statewide assessment of mercury in predatory fish, largely from lakes and reservoirs that had never been sampled.
- Water chemistry and physical characteristics were measured at each lake, and some of these were strongly associated with high mercury concentrations in fish.
- Atmospheric deposition of mercury across the Northeast has contributed to high mercury levels in fish, even in wilderness lakes remote from any point sources.
- Efforts to reduce emissions and deposition of mercury will require continued monitoring in order to demonstrate the anticipated declines in fish mercury levels.



## CONCLUSIONS

- Mercury continues to be present at high levels in large, predatory fish from certain waters, especially in the Adirondacks and Catskills. Monitoring mercury levels in fish from high-use waters should be continued.
- Individual lakes vary greatly in their response to mercury. It is important for resource managers to evaluate lakes individually rather than regionally.
- Anglers should check the latest fish consumption advisories published yearly by the NYS Department of Health.

## ACKNOWLEDGMENTS

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- We thank seasonal F&W technicians E. Latremore, D. Edwards, C. Swamp, N. Liddle and T. Pope at the DEC Rome Field Station for their long hours and enthusiasm on the project.
- Staff from the Adirondack Lakes Survey Corp. collected fish and water samples from northern NYS under a separate NYSERDA contract and were invaluable in cooperative efforts ensuring smooth sampling operations.
- We also thank the DEC regional fisheries staffs for their assistance in collecting fish samples from a number of lakes.

