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Lake Erie Basin  
Michigan State University Cooperative Extension Service  
Michigan SeaGrant  
Issued January 1990  
4 pages

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## LAKE ERIE

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Lake Erie is the eleventh largest lake in the world (by surface area). It is the fourth largest of the Great Lakes in surface area and the smallest by volume. Ninety-five percent of Lake Erie's total inflow of water comes via the Detroit River from all the "upper lakes" — Superior, Michigan and Huron — the St. Clair River, Lake St. Clair, and numerous tributaries. The rest comes from precipitation. Lake Erie is the shallowest of the Great Lakes and is especially vulnerable to fluctuating water levels. Wind setups (wind pushing the water from one end of the lake toward the other), usually from west to east, have produced large short-term differences in water levels at the eastern and western ends of the lake, the record being more than 16 ft (4.88 m).

The water provided by Lake Erie for waterborne commerce, navigation, manufacturing, and power production has led to intensive industrial development along its shore. However, the basin's moderate temperatures have also encouraged recreation and agriculture. Lake Erie is the warmest and most biologically productive of the Great Lakes, and the Lake Erie walleye fishery is widely considered the best in the world. Point Pelee National Park in Lake Erie is the southernmost point on Canada's mainland.

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## WATER USE

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The Great Lakes provide water for many purposes: residential, commercial and institutional facilities; agricultural operations; industrial processes; electric power generation; navigation; sanitation; recreation; and habitat for fish, waterfowl and other aquatic organisms. More than 11 million people obtain their drinking water from Lake Erie. In 1987, the Great Lakes states and provinces established at the Great Lakes Commission a regional water use data base for the Great Lakes basin and the individual lakes. However, as of 1989, it was not yet possible to obtain accurate information for all categories of water use in Lake Erie.

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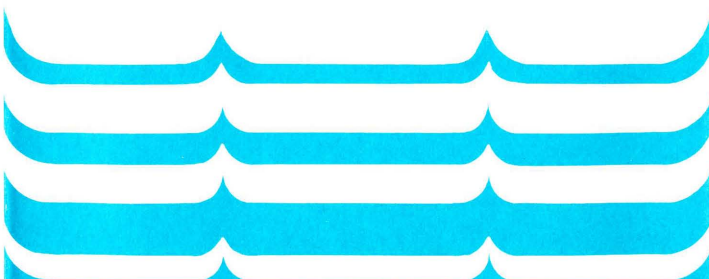
## ECONOMIC IMPORTANCE

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**Manufacturing:** 36 percent of U.S. cars/trucks/buses and 38 percent of Canadian cars and trucks are produced in the basin, which is also a principal



# LAKE ERIE



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**Improvements:** In 1985, the Great Lakes states and provinces agreed to clean up and restore the AOCs in the basin. Each jurisdiction is developing "remedial action plans" (RAPs) to control and stop existing sources of pollution and restore water quality in its AOCs. The governments will report to the IJC regularly on progress in developing and implementing the RAPs. Significant reductions in phosphorus loadings have resulted from improved controls, including the banning of detergents with high phosphate levels by Ohio's northern communities in 1988. Mercury, PCB and DDT levels in fish samples have declined due to upstream industrial controls.

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## SPONSORS/INFORMATION SOURCES

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### MICHIGAN SEA GRANT COLLEGE PROGRAM

Michigan State University  
334 Natural Resources Building  
East Lansing, MI 48824-1222 (517) 353-9568  
or

The University of Michigan  
2200 Bonisteel Boulevard  
Ann Arbor, MI 48109 (313) 764-1138

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International Joint Commission  
Great Lakes Regional Office  
100 Ouellette Avenue, Eighth Floor  
Windsor, ON N9A 6T3 (519) 256-7821

or  
P.O. Box 32869  
Detroit, MI 48232-2869 (313) 226-2170

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### CANADA-ONTARIO AGREEMENT

Environment Canada  
Communications Directorate  
25 St. Clair Avenue East, Room 600  
Toronto, ON M4T 1M2 (416) 973-6467

or  
Ontario Ministry of the Environment  
Public Information Centre  
135 St. Clair Avenue West  
Toronto, ON M4V 1P5 (416) 323-4321

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Great Lakes Commission  
The Argus Building II  
400 Fourth Street



steel producing area. Glass manufacturing is another significant industry.

**Power Generation:** The largest fossil-fueled electrical generating plant in the world is located on Lake Erie at Monroe, Michigan.

**Agriculture:** The economy along the lake's western and northern shores is based on agriculture. Approximately 10 percent of Canadian farms and 30 percent of Canadian farmland is located in the region. Sixty-three percent of Canadian sheep and lambs are raised in the Lake Erie basin. Lake Erie leads the Great Lakes basin region in number of farms and in the production of hogs and pigs, sheep and lambs, chickens, corn, soybeans and wheat. Major products: vegetables, grapes and orchard fruits, wine, tobacco (Canada), dairy products (U.S.).

**Shipping:** 13 ports serve as major distribution centers for iron ore, coal, manufactured goods and grain.

**Mining:** Sand and gravel for construction; limestone and salt.

**Fishery:** Commercial fishing — Major species caught in U.S. waters: white bass, yellow perch. Value of 1986 U.S. catch was \$1,050,800 (U.S.) for 4,470,193 lb (2,031,906 kg). Major species caught in Canadian waters (including Lake St. Clair): smelt, yellow perch, walleye, white bass. Value of 1986 Canadian catch was \$36,472,948 (CDN) for 21,551,074 kg (47,412,362 lb). Sportfishing — Largest in the Great Lakes. Major species: walleye, yellow perch; almost 20 million angler days in 1985; annual economic impact is \$613 million (U.S.) from sportfishing in U.S. waters, \$37 million (CDN) from angling in Canadian waters.

**Recreation:** Marina industry sales of \$343 million (U.S.) in 1986. Ohio's Lake Erie shoreline has an average of almost one marina per mile.

## RESOURCE ISSUES

**Problem:** Urban flooding and shoreline erosion.

**Source:** Development in floodplain areas without adequate planning or regulation.

**Effects:** Property damage, safety risks, economic losses, loss of wetlands.

**Improvements:** Some legislation and government incentives for relocating jeopardized structures.

**Problem:** Water quality. Industrial, navigational, municipal and recreational uses of the Great Lakes add pollutants to the ecosystem. Some of them may stay in the water or lake sediments for hundreds of years and affect other uses of the water. Pollution is usually most severe in major population centers on Great Lakes rivers, harbors and connecting channels. The types of problems include: toxic substances in water, sediments and fish; damage to other organisms living in or depending on the water; elevated levels of bacteria; high levels of phosphorus and other nutrients; heavy metals; and aesthetic problems.

The types and severity of water quality problems vary throughout the Great Lakes basin. However, the International Joint Commission (IJC) and Great Lakes jurisdictions have designated 42 "areas of concern" (AOCs) because of their special water quality problems. Nine out of 10 of Lake Erie's AOCs are river systems that are located in urban areas and flow into the lake. Because of their locations, they have received large inputs from industries, municipalities and agriculture over the past century.

**Sources:** Chemical, steel and automobile industries; wastewater treatment plants; leaking landfills; overflows from combined storm and sanitary sewers; agricultural and urban runoff; and atmospheric deposition are all sources of pollution to Lake Erie.

**Effects:** The effects of water quality problems vary with the types of pollutants in the area. Phosphorus loadings: eutrophication (overfertilization of water, which causes excessive plant and algae growth). Toxic organic substances: contamination of fish and wildlife, human health risks, economic losses. Coliform bacteria: human health risks, taste and odor problems. Heavy metals: contamination of fish and wildlife, human health risks, recreational and economic losses.\*

Institute of Water Research  
Michigan State University  
334 Natural Resources Building  
East Lansing, MI 48824-1222 (517) 353-3742

The Center for the Great Lakes  
435 North Michigan Avenue - Suite 1408  
Chicago, IL 60611 (312) 645-0901

or

The Centre for the Great Lakes Foundation  
320 1/2 Bloor Street, West, Suite 301  
Toronto, ON M5S 1W5 (416) 921-7662

Other publications in this series are: Great Lakes Basin (E-1865, MICHU-SG-89-503); Lake Superior (E-1866, MICHU-SG-89-504); Lake Michigan (E-1867, MICHU-SG-89-505); Lake Huron (E-1868, MICHU-SG-89-506); and Lake Ontario (E-1870, MICHU-SG-89-508). For additional copies, contact one of the organizations listed above, your county Extension office, or the MSU Bulletin Office, 10-B Agriculture Hall, East Lansing, MI 48824-1039.

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# Lake Erie

Lake Erie has the largest sport fishery of the Great Lakes.

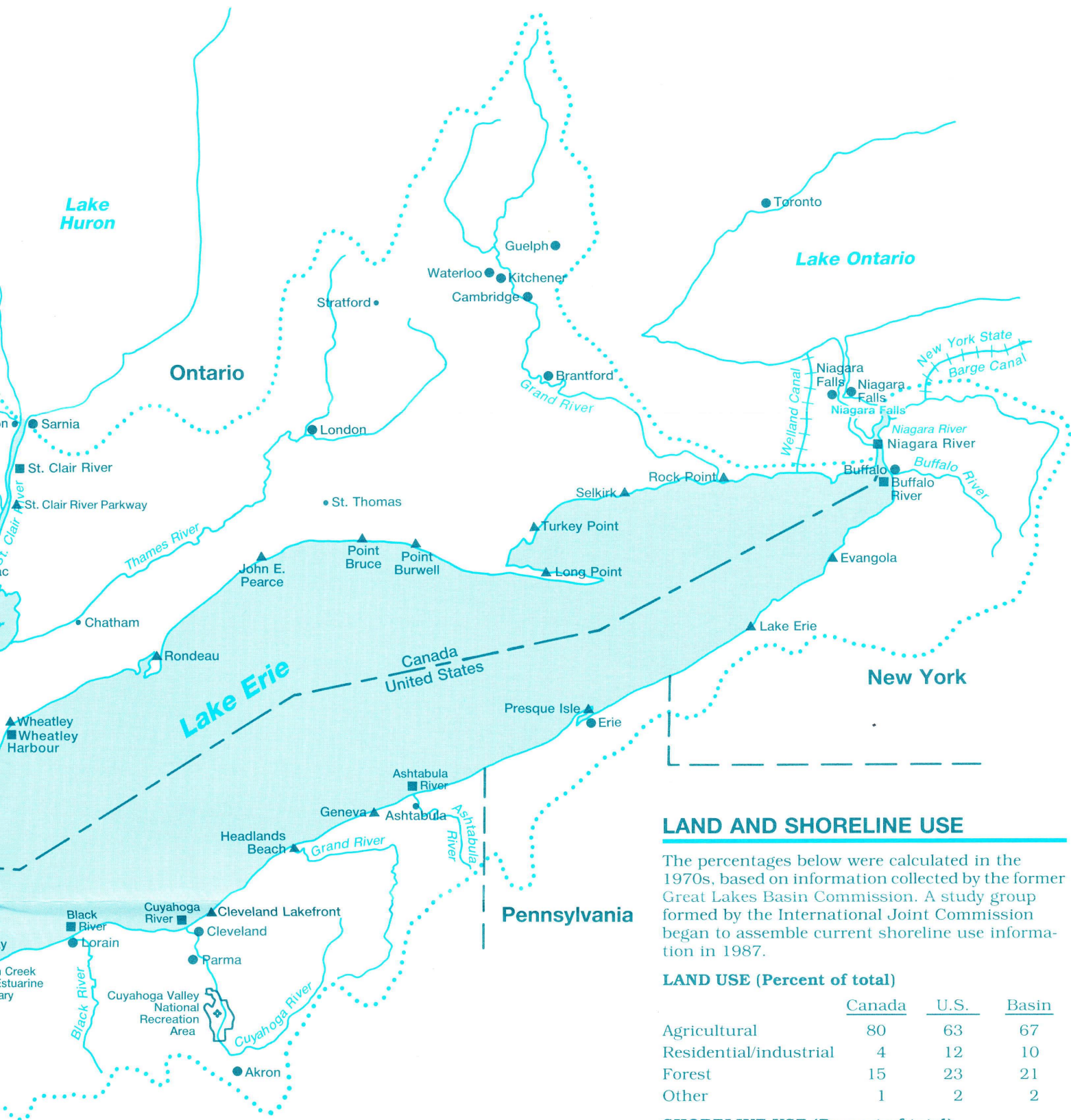
## LAKE ERIE DIMENSIONS

LENGTH	210 mi / 338 km
BREADTH	57 mi / 92 km
DEPTH	62 ft / 19 m average; 210 ft / 64 m maximum
VOLUME	116 mi <sup>3</sup> / 483 km <sup>3</sup>
WATER SURFACE AREA	9,906 mi <sup>2</sup> / 25,657 km <sup>2</sup>
DRAINAGE BASIN AREA	22,720 mi <sup>2</sup> / 58,800 km <sup>2</sup>
SHORELINE LENGTH	871 mi / 1,400 km (including islands)
ELEVATION	571 ft / 174 m
OUTLET	Niagara River and Welland Canal
RETENTION/REPLACEMENT TIME	2.6 years (shortest of the lakes)
POPULATION	9,183,347 (U.S.); 1,742,805 (Canada)

## LEGEND

- — — International Border
- — — State/Provincial Border
- ..... Basin Boundary
- ❖ National Park
- ▲ State/Provincial Park
- ▲ National Forest
- Area of Concern
- City





## LAND AND SHORELINE USE

The percentages below were calculated in the 1970s, based on information collected by the former Great Lakes Basin Commission. A study group formed by the International Joint Commission began to assemble current shoreline use information in 1987.

### LAND USE (Percent of total)

	Canada	U.S.	Basin
Agricultural	80	63	67
Residential/industrial	4	12	10
Forest	15	23	21
Other	1	2	2

### SHORELINE USE (Percent of total)

	Canada	U.S.
Residential	39	45
Recreational	8	13
Agricultural	21	14
Commercial	10	12
Other	22	16